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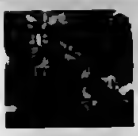
QUICKSTUDIES

BUSINESS: Calculating your hardware's worth, page 47. TECHNOLOGY: Corporate portals, page 73



BEST PLACES TO WORK

We pick the top companies for training, compensation, hot projects and plenty of perks. Supplement follows page 40.

THE DEFINITIVE DELL

At PC Expo, Michael Dell says the PC era is far from over and comments on Compaq's woes. Page 14

COMPUTERWORLD

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USERS POP HOOD ON APP HOSTING

Service has appeal, but suppliers face scrutiny

BY BOB WALLACE AND BARB COLE-GOMOLSKI

In the quest for ever-more efficiency, the red-hot application-hosting market has caught the eye of IT managers at many large corporations. But most want answers about the capabilities of application service providers before they take the plunge.

The benefits offered by outsourcing application hosting to a third party are compelling for many users and include lower costs, fewer staffers and better service and support.

However, large corporations want evidence that application service providers have the bandwidth capabilities, can deliver acceptable application availability levels and have the expertise necessary to handle the software packages, security and support, said Jim Fey, director of strategic technologies at PMI Mortgage Corp. in San Francisco.

ROBERT CARTER: FDX may offer app hosting to customers

Ten of 12 large corporations interviewed last week by *Computerworld* said they are watching this new service market with interest and are evaluating the option as part of their ongoing information technology strategic planning efforts.

"We could build our own data centers around the world to provide this service, but that's probably not the most cost-effective use

App Hosting, page 16

CAR-BUYING SITE DRIVES INDUSTRY TO ONLINE SELLING

AutoNation model means no dealer visit

BY BOB WALLACE AND JULIA KING

With a business-savvy CIO at the helm, top U.S. auto retailer AutoNation Inc. last week unveiled a first-of-its-kind master e-commerce site that lets consumers buy and take delivery of a new or used car without ever visiting a dealer.

The initiative, which was launched with a pilot involving 17 dealers in Tampa, Fla., illustrates the pluses (including increased sales) and minuses (such as sales-channel conflict) that the auto industry faces as it strives to move from a 100-year-old sales model to online selling, which represents the long-term future.

"This initiative has the potential to radically restructure

Car-Buying Site, page 101

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LICENSE CHANGE EYED FOR WIN 2K

Microsoft mulls move to server-centric model; analysts say briefings slated for this week

BY SHARON GAUDIN

Microsoft Corp. is seriously considering changing its licensing policy for Windows 2000 to a server-centric model, according to industry sources.

The company, which so far has stuck with a client-oriented licensing model, will brief analysts on its plans next week. It has spoken to at least one major user and IBM about the change. A spokesman declined to discuss the company's licensing plans late last week.

A source who has talked to Microsoft about the licensing issue but asked not to be identified said, "They're under pressure from their customers to go to a server-centric model. Microsoft is bearing from its users that its licensing is an impediment to Windows 2000 adoption. They're mulling over what they're going to do."

Users and analysts agreed that if Microsoft wants Windows 2000 to be a mission-crit-

Microsoft, page 101

> Microsoft touts low cost of ownership, but if you look at it, it's a high-cost solution.
>
> DAN KUSNETZKY, INTERNATIONAL DATA CORP.

THE ART OF PERSUASION

The next generation of corporate systems and Web sites will include appeals to the human psyche — flattery, seduction, competition, humor, positive reinforcement — in hopes of boosting sales or altering the end user's behavior, Gary H. Anthes reports. But unless IT managers are careful, these "persuasive technologies" could cross the ethical line into the realm of deceptive practices and trigger government regulation.

Report begins on page 76.

◀ ANDY CARGILE, group manager at Drugstore.com Inc., says ethical considerations have been built in to the Web site's automated "shopping advisers"

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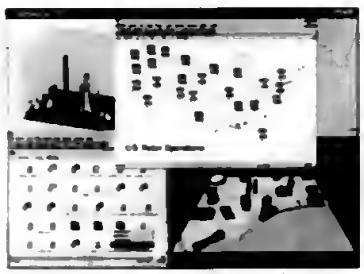

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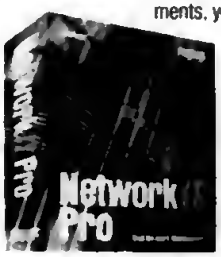

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MINIMOBILES

Whoa! Minimobiles have finally hit the business scene at full speed, but our survey indicates that users aren't tapping their potential. They mainly use their handhelds for scheduling and calendaring. Page 79

GPS HITS THE SPOT

Global Positioning Systems find their way into the corporate world. We test three variations of GPS gadgets. Exec Tech, page 74

COMPUTERWORLD THIS WEEK

JUNE 28, 1999

NEWS 4

4 **KMART ROLLS OUT** systems that let customers electronically order bulky items.

4 **BP AMOCO MOVES** some key apps to SAP R/3 and outsources systems to Andersen Consulting.

8 **MONSTER.COM** will allow contractors to auction their services via the Web.

10 **CABLETRON SPINS OFF** its Spectrum network management software.

12 **SOME CUSTOMERS TAKE** a thin-client approach for new Lotus Domino applications.

14 **MICHAEL DELL SAYS** one PC maker is "on the wrong planet" (Hint: It's not his company).

OPINION

36 **ABANDONING SHIP:** That's what a partner at Mohr, Davidow Ventures says IT directors are doing to launch outsourcing ventures of their own.

36 **MONEY FLOODING** into technology ventures could be a new headache for IT, as the start-up frenzy spreads out from the Bay area, writes Dan Gillmor.

MORE

Editorial Letters 34,35
How to Contact CW 99
Shark Tank 102
Stock Ticker 100
Company Index 99

BUSINESS 41

42 **CUSTOMER** service gets a boost at Penske Truck Leasing, where new reporting tools give more data to clients faster.

42 **RETRAINING** for Java can be done, but companies may still want to hire outside help.

43 **W. B. MASON** takes on office-supply rivals with new Web capabilities.

45 **Y2K CONFIDENCE** grows in *Computerworld*'s latest survey of IT professionals.

46 **MARKET FORCES** and technology blur the line between products and services companies, Jim Champy writes.

47 **IN QUICKSTUDY:** Knowing about returns (on assets, investments, equity) can help you justify your IT purchases.

54 **BUILD A Y2K** "command center." Here's how.

56 **CIO-LESS?** Meet four super recruiters who can help you find a new one.

58 **THE JARGON JUDGE** bounces "sticky eyeballs."

60 **PROFESSIONAL** associations abound: Which is for you?

62 **CAREER ADVISER:** Coping with wearing too many hats.

62 **WORKING AT** Lincoln Electric means teamwork, quality systems, whopping bonuses — and lots of cookies.

TECHNOLOGY 63

SOFTWARE

65 **MOVING TO WINDOWS** 2000 means deciding what data to move to Active Directory.

65 **SUN'S** Ed Zander describes how the company will merge its own NetDynamics application server with the Netscape Application Server, and what the move means for customers.

66 **UNITED AIRLINES** is using parallel processing to fine-tune its seating assignments.

HARDWARE

68 **WHY DID EBAY'S** Web site crash? There are still more questions than answers.

68 **WHEN A CELL PHONE** is too little and a notebook computer is too much, a two-way pager can be just right.

NETWORKS

69 **BELL ATLANTIC** is the first Baby Bell to announce a nationwide managed virtual private network.

69 **INTERNET GUARDIANS** combine e-mail content filtering with spam and antivirus functions. Is that more power than IT wants?

70 **YOU'LL NEED A CODEC** to stream audio over a network. We tell you what to look for.

72 **EMERGING COMPANIES:** Bow Street Software combines XML with directory services to make it easier for IT managers to customize data presentation over the Web.

TECHNOLOGY SELLS WELL. BOOKS SELL WELL. BUT THAT IS NOT REALLY WHAT KMART SELLS A LOT OF. OUR TARGET CUSTOMER IS A MIDDLE-AGED HOUSEWIFE WHO MAY NOT EVEN HAVE A COMPUTER.

TERRY BARWIN, VICE PRESIDENT OF IS, KMART CORP., SPEAKING ABOUT KMART'S E-COMMERCE PLANS AT A RETAIL SYSTEMS CONFERENCE EARLIER THIS MONTH. SEE PAGE 4.

AT DEADLINE

HP's Internet Push Has Interex Downside

Hewlett-Packard Co.'s recent Internet push may be having an unintended effect on Interex, HP's hardware-oriented user group. An anonymous source said HP is "de-investing in marketing and other activities that support the user group" by focusing on electronic services. A senior Interex member who requested anonymity said much of the co-marketing funds HP previously offered to third-party vendors supporting its hardware are now being funneled to HP's new Internet partners. One result: HP hardware partners who used to sponsor Interex events on longer have the funds to do so.

Three Big Banks Team To Offer Online Billing

A new, online billing services company – launched last week by three major banks playing catch-up – will let customers view and pay bills online starting in the fall. Code-named The Exchange by Chase Manhattan Corp., First Union Corp. and Wells Fargo & Co., the venture initially will help consumers pay credit-card and mortgage bills.

Oracle to Set Global Standard Pricing List

Oracle Corp., long known for its willingness to wheel and deal, plans to set a standard, global price list for its software by next June. Jeremy Burton, a marketing vice president at Oracle, said the company will switch to a no-haggle approach in which discounts typically are based only on the number of licenses being bought.

Worms, Viruses Cost Users $7.6B So Far

Invasive computer programs such as the recent Melissa virus and Worm.ExploreZip cost U.S. companies $7.6 billion this year in clean-up costs and lost productivity, according to a report based on a survey of 185 Fortune 500 firms. Analyst Michael Erbschloe at Computer Economics Inc. in Carlsbad, Calif., said that estimate is conservative.

BP Amoco to Move Financials To SAP R/3, Then Outsource

Arco to switch from Oracle to SAP for North Sea oil operations

BY STACY COLLETT

IN A MOVE to blend three information technology infrastructures in the North Sea region, BP Amoco PLC will standardize its upstream financial applications on SAP AG's R/3 and outsource the operation to Andersen Consulting.

Atlantic Richfield Co. (Arco) will also switch its upstream applications in the region — the systems associated with oil drilling and refining — from Oracle Corp. applications to SAP after its merger with BP Amoco is complete, Andersen officials said.

British Petroleum Co. (BP), which previously ran homegrown financial applications, has just completed the move to SAP, according to Kevin Campbell, a managing partner at Andersen.

Amoco Corp. was completing a massive R/3 implementation just as it was acquired by BP last August. Amoco's SAP work will be taken over by Andersen.

Andersen won't be employing any European SAP staff from BP Amoco, Campbell said. Arco officials declined comment on the move; BP Amoco didn't respond to calls seeking comment.

Industry watchers expressed doubts that BP Amoco can meld three, massive IT infrastructures. Many suggested that they continue to operate independently.

In buying Arco for $28.6 billion, BP Amoco expects to save $1 billion by eliminating overlapping systems and combining IT business processes (News, April 5).

"There's a huge cost to conversion in the first place. But BP must feel comfortable about their own model and the way they operate," which is predominantly through outsourcing, said Martin Tallett, president of consulting firm Ensys Energy & Systems Inc. in Flemington, N.J.

Struby Overton, executive director at Petrotechnical Open Software Corp., a nonprofit, industry standards group, said oil producers are moving toward IT standards in their quest to be more financially successful.

"The whole move within the industry is to try to get as much integration as possible with the applications and data. The best way for [BP Amoco and Arco] to get there is to select a standards-based platform," Overton said. ▶

Attention E-Shoppers: Kmart Expands Electronic Options

Moves include in-store ordering systems and bigger Web inventory — but who's buying?

BY JULIA KING AND DAVID ORENSTEIN

Discount retail giant Kmart Corp. is picking up its lumbering pace in the forced march toward electronic shopping.

As of last week, the Troy, Mich.-based discounter had rolled out in-store systems that let customers electronically order bulky items like big-screen TVs at 600 of its 2,161 stores.

By year's end, the systems will be in 1,000 stores and will include new products and services, like money orders and theater tickets, that are unusual for a discounter to offer.

Kmart also said it has added thousands of products, ranging from music to baby products, to its seven Internet-based specialty stores (*www.kmart.com*), and named two senior executives to oversee its e-commerce efforts.

Paul Sauser, the company's new president of electronic commerce, will report directly to Kmart CEO Floyd Hall. James Eckl, the new vice president of e-commerce, will oversee development of the company's Internet shopping division, which includes the in-store systems.

A company spokesperson said that executives recently put in place a merchandising and operations team that covers logistics and fulfillment, systems, business-to-business sales and finance and credit.

Kmart declined requests for interviews with the new executives. But others at the company confirmed its accelerated pace into e-commerce.

"We are researching heavily what sells on the Web," said Terry Barwin, vice president of IS, speaking at a retail systems conference earlier this month.

"Technology sells well. Books sell well. But that is not really what Kmart sells a lot of," Barwin said. "Our target customer is a middle-aged housewife who may not even have a computer. She is not going to buy a PalmPilot."

Analysts agreed that Kmart may indeed be steps in front of its customers, even though it's considered an e-commerce laggard when compared with specialty retailers like The Gap Inc. in San Francisco and catalog companies like L. L. Bean Inc. in Freeport, Maine.

"There's still a question as to whether their [customer] demographics map online. Wal-Mart [Stores Inc.] and Kmart customers are looking for low price points," said Scott Smith, an e-commerce consultant at Tera Group LLC in McLean, Va.

Online shoppers, by contrast, are typically "at higher income levels and are looking for a deal, rather than looking for low prices as a way of life," Smith said. ▶

Corrections

A May 31 News story ("HDS Jumps In With 8-Way NT Server," page 16) misidentified James Governi's company. He is an analyst at Aberdeen Group Inc. in Boston.

A June 7 News story ("Amdahl's Big Iron Falls Short," page 1) misidentified the research firm at which analyst Colin Parkinson works. It is Giga Information Group Inc. in Cambridge, Mass.

Office Depot Settles Y2K Suit

Office Depot Inc., one of the nation's biggest retailers of computer products, has settled a year 2000-related lawsuit alleging that Office Depot and other retailers failed to disclose to consumers whether products they purchased were year 2000-compliant.

Under the terms of the settlement, Delray Beach, Fla.-based Office Depot agreed to take steps to alert current and past customers of the need to determine whether the computer systems it sells are Y2K-compliant. The steps include posting basic Y2K information on the Web (*www.officedepot.com*) and providing that notice to customers who purchase hardware or software.

The settlement is the first in a lawsuit (*Johnson v. Circuit City*) filed in California this spring. Other defendants include OfficeMax Inc. and CompUSA Inc. The trial is expected to begin in the fall.

— *Thomas Hoffman*

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Internet Tax Talk Moves From 'If' to 'How'

Commission: Tax-rule reform needed first

BY PATRICK THIBODEAU
WILLIAMSBURG, VA.

Businesses, and to some extent state officials, are divided on the issue of whether Internet commerce should be taxed.

But most agree that if taxes are applied to Internet transactions, the current complex maze of state and local sales tax rules will have to be dramatically reformed.

For instance, common definitions about what is a taxable good or service would need to be established, and the number of tax forms companies have to return would have to be reduced.

SCHWAB'S DAVID POTTRUCK: No special treatment for the Internet

That was one of the key messages to come out of last week's meeting here of the 19-member congressional commission formed to consider Internet tax policies, and it was best expressed by commission member Michael Armstrong, chairman and CEO of AT&T Corp.

"We've got to use this opportunity for simplicity," Armstrong said. AT&T fills out 39,000 tax forms annually to satisfy federal, state and local government taxing requirements, he said.

Armstrong also argued for tax neutrality — a tax system that doesn't saddle a particular industry with special taxes.

For instance, the telecommunications industry pays a telecommunications excise tax that was first implemented to help pay for the Spanish-American War.

But Armstrong didn't lobby against taxing Internet commerce, and few members on the Advisory Commission on Electronic Commerce, which met for the first time last week, expressed outright opposition to the idea. Some form of Internet taxation seems inevitable.

"The Internet should not be favored over other forms of commerce," said David Pottruck, president and co-CEO of Charles Schwab & Co.

But there were exceptions to that view, most notably Dean Andal, chairman of the California Board of Equalization, which administers the state's sales and use taxes.

He said there was no evidence that Internet retail sales were hurting other sales tax collections.

"I believe that we ought to deal with facts," Andal said, "before we chase out these existing tax systems that have allowed the Internet to grow."

So far, the Internet has had little impact on government tax collections.

Not Much Lost

Only about $170 million — 0.1% of total state and local government sales and use tax collections — was lost because of Internet commerce, according to a 50-state study released last week by Ernst & Young LLP. The report is at *www.ey.com/ecommerce/sky.asp*.

AT&T'S MICHAEL ARMSTRONG: Favors tax neutrality

Still, the issue that will get the most attention concerns sales tax collections by remote sellers. Businesses, under court rulings, have to collect taxes only in states where they have a physical presence.

Customers may still owe the sales tax to their home state, but most don't pay it.

Utah Gov. Michael Leavitt said that he wants to focus on that problem and, echoing Armstrong's view, that a "radical simplification" of the sales tax system will be needed to make it easier for businesses to comply. One change might be consolidating filing requirements.

The commission must complete its work by next April, approximately six months before the federal moratorium on new Internet taxes will expire.

As Antitrust Trial Ends, Judge Hints at Thinking

Jackson: 'Assume it's a monopoly . . .'

BY PATRICK THIBODEAU
WASHINGTON

With testimony concluded in the Microsoft Corp. antitrust case, attention is now riveted on two issues: the possibility of a settlement and speculation over a verdict by Judge Thomas Penfield Jackson, who last week offered the strongest clues yet as to what he is thinking.

For example, one question from Jackson to Microsoft witness Richard Schmalensee, dean of MIT's Sloan School of Management, was prefaced with the premise, "Assume Microsoft is a monopoly . . ."

At another point last week, Jackson compared Microsoft's operating system dominance with Wal-Mart Stores Inc.'s impact on a small town. Schmalensee said consumers might be better off with a megamart than with many small stores. But Jackson said, "Then you have a benevolent despot with a monopoly."

"Judge Jackson has not been shy about his disdain for Microsoft and its inappropriate business practices," said Hillard Sterling, an attorney at Gordon & Glickson PC in Chicago.

During 76 days of testimony, attorneys explored a broad array of government charges, including allegations that Microsoft illegally tied its browser to its operating system, "polluted" Java and bullied PC makers to dump Netscape Navigator.

Many Possibilities

But even if Jackson rules against Microsoft, it doesn't mean the government necessarily wins; he could offer a mixed verdict. The battle has been far from one-sided, and the judge has given Microsoft its due at times, especially on Microsoft's approach to Java.

And the case could go all the way to the Supreme Court.

Both sides left the courthouse last week saying they were still open to a settlement. But the outlook remains poor.

In court last week, Microsoft worked hard to show that it isn't a monopoly and that it faces competitive threats, especially from America Online Inc.

But once again, as has happened so often in the case, a piece of evidence turned up to cast doubt on that contention. Notes from a Microsoft meeting in December, taken by an unidentified official, quoted Microsoft Chairman and CEO Bill Gates as saying, "AOL doesn't have it in their genes to attack us in the platform space."

Vendor Coalition to Keep Tabs on Suppliers' Y2K Readiness

BY JAIKUMAR VIJAYAN

Measures to ensure the Y2K readiness of key suppliers to the computer industry received a boost last week with the creation of a multivendor coalition called the High Tech Consortium (HTC).

The nonprofit organization representing 27 vendors — including Cisco Systems Inc., Dell Computer Corp., Hewlett-Packard Co., Motorola Inc. and Solectron Inc. — will collect, assess, monitor and share information on the Y2K readiness of their component suppliers.

"What this means is that customers can have a much higher degree of certainty that the supply chain in the high-tech industry has been well vetted of any problems," said Tom Oleson, an analyst at International Data Corp. in Framingham, Mass. However, the data is for vendor eyes only.

Representatives from HTC member companies will get a standard set of tools and methods to assess and audit Y2K readiness of suppliers, and they then will post their findings in a secure, Web-accessible database, called the Data Sharing Service. The assessment process will allow member companies to identify alternate sources in case a particular supplier isn't Y2K ready.

The consortium is the result of vendor efforts to pool their resources and collectively address supply-chain issues relating to the year 2000 problem, said an HTC spokesman.

Because many high-tech companies share the same suppliers, the HTC will save time and reduce duplication of effort, he said. Suppliers benefit because they can use the HTC assessment to fulfill Y2K-compliance requests from other companies, the spokesman said.

JUST THE FACTS

Year 2000 And Beyond

What is the HTC? A multivendor nonprofit consortium that will assess and share information on the year 2000 readiness of suppliers and computer vendors.

Why are they doing this? Member companies have many common suppliers. HTC offers a forum to share information and avoid duplication of work.

Who are some members? Cisco Systems, Hewlett-Packard, Dell, Motorola, Solectron and others.

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—*Source: PeopleSoft Web Site*

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—*Source: Siebel SEC Filing 11/13/98*

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BRIEFS

Hoax Author Pleads Guilty to Fraud

A former employee of Tustin, Calif.-based PairGain Technologies Inc. pleaded guilty to fraud charges in connection with his attempt to spike the company's stock price by posting a false news story on a Web site. Gary David Hoke, 25, a former engineer at PairGain's Raleigh, N.C., design center, created a bogus Bloomberg LP news story that PairGain was being acquired. Hoke faces up to 20 years in prison and a $2 million fine.

Full Price at Nike.com

Nike Inc. in Beaverton, Ore., launched a redesigned online store last week at www.nike.com. It contains more than 500 products, all of which Nike is selling at full retail price. But the company is waiving shipping charges, at least temporarily. By contrast, real-world retailers and shoe outlets that carry Nike products can offer discounts.

Oracle Buys Scheduler

Oracle Corp. last week said it will buy a small Dutch vendor of software for scheduling field service workers. The package, developed by Geodan EDT BV, will be renamed Oracle Scheduler and will be tied to a wireless application for communicating with service technicians. The purchase price wasn't disclosed.

Sun, Microsoft Spar

Sun Microsystems Inc. and Microsoft Corp. were back in court last week filing dueling motions for summary judgments in Sun's Java copyright lawsuit. Microsoft says it has the right to some leeway to reworking Java for its products, while Sun attorneys say Microsoft doesn't. U.S. District Court Judge Ronald Whyte hasn't indicated when he will rule on the motions.

Short Take

MICROSTRATEGY INC. this week will announce Strategy.com, a personalized, intelligent information service that pushes data out to consumers via Web pages, pagers, faxes, voice mail and e-mail.

Site to Collect Bids For Contract Workers

Monster.com readies site for free agents

BY BARB COLE-GOMOLSKI

THE POPULAR Internet auction is about to merge with the Web-based recruiting industry. Early next month, Monster.com, one of the largest Internet job boards, will launch a service so contractors and other free agents can auction their services via the Web.

The service, Monster Talent Market 1.0, could help companies quickly locate information technology specialists, which Maynard, Mass.-based Monster.com said account for about 25% of the 350,000 contractors who use the site.

To use the service, contractors will pay a small fee — possibly as little as $5 per month — and companies will pay a percentage of the contract to Monster.com. Details were still sketchy last week, but the company said the service would cost companies significantly less than a typical recruiter's fee.

Terri Kemmerer, manager of IT human resources at Cargill Inc. in Minneapolis, said the move illustrates the shifting balance of power in employment. "We've had this mentality that we are the puppet masters [in control of workers], but it's really flipping around," she said.

HOW IT WORKS

How Auction Site Works

- Contractors develop a profile defining their ideal assignment, desired rate and project scope. They can also include their experience, skills and education.
- Interested companies look over the profiles and actively "bid" on the individuals who fit their staffing needs.
- The free agent controls the bids and accepts the preferred assignment.

Shop Around

Auctions will let contractors see what they're worth and seek the best deals. Kemmerer said she might use the service to staff a short-term project but will probably continue using third-party agencies to get long-term contractors.

Though Monster.com bills the service as an auction, the auction aspect extends only through the bidding process. Once a contractor acknowledges interest in an assignment, the two parties would probably check each other out in more traditional ways, including running reference checks.

Also, the highest bidder doesn't necessarily win. Contractors will choose their assignments, and they could pick a low bidder if, for instance, the company is located near their home.

Nevertheless, companies would bid without knowing whether a person's credentials were legitimate and without checking his references, which some analysts said seemed risky.

Consultants said they also have mixed feelings about the service. Some said it would be an easy way to market their services to a much broader audience. But others, such as Chris Wise, president of Wise Business Solutions Inc., an IT contracting firm in Milford, Mich., said they have a hard time picturing themselves on the auction block.

"Our service is based heavily on relationships," Wise said. He said another concern is that the auction model might give clients the notion that his services are a commodity.

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Oracle, PeopleSoft Offer New Approaches to Live Training

Users say they prefer homegrown programs to satellite, Web plans

BY CRAIG STEDMAN

Oracle Corp. tried broadcasting software training classes to users by satellite but gave up after a year. Now rival PeopleSoft Inc. is getting ready to give it a go.

PeopleSoft last week announced plans to launch a satellite-based system for delivering live training broadcasts to hundreds or even thousands of workers at companies that buy its enterprise resource planning (ERP) applications. Six months of tests are scheduled to start in mid-July.

Meanwhile, Oracle, which dropped its satellite network eight months ago, is developing interactive, Web-based training software that's due in three months. Both strategies are aimed at giving companies a lower-cost way to train many of their employees.

That's a noble idea, some users said. But for now, they still see developing in-house, custom training programs as the best choice for bringing the bulk of their end users up to speed on ERP software.

For example, MacManus Group is customizing PeopleSoft's financial and project-management applications for an installation due to go live this fall. Because of that, generic training "wouldn't cut it for our front-line users," said Jim Dileo, senior vice president of worldwide information technology at the New York-based advertising and public relations firm.

MacManus has sent about a dozen IT workers to PeopleSoft classes, and the satellite feed might help save money on that training and travel expenses, Dileo said. But the company last month started its own classes for the 3,500 workers who will use the software.

Broadcasts and Web-based training can be relatively inexpensive and even entertaining, said Colleen Shutrump, an analyst at International Data Corp. in Framingham, Mass. But most technical training "still belongs in a classroom with a learning lab attached to it," she added.

JUST THE FACTS

PeopleSoft's Satellite Tact

How it works: Classes will be broadcast live and displayed on PCs. Users will be able to ask questions via audio or e-mail and watch demonstrations of how to use PeopleSoft's applications.

What it costs: Prices start at $2,500 per month for a one-year subscription covering 10 concurrent users. That includes installation of the satellite equipment and an attached LAN.

When it will be on: 11 hours of broadcasts are scheduled on all business days. About 30 classes will be available at first, and more than 100 are being developed by PeopleSoft.

The Boeing Co. is one company that already uses satellite technology to broadcast both technical and business training classes to its employees. But the Seattle-based aircraft maker still develops most of its own classes on technical subjects such as Unix, C++ programming and Oracle database administration.

"You really need to design the courses so there are reasons for people to stay involved and pay attention," said David Dunnington, direct broadcast services manager at Boeing.

PeopleSoft, in Pleasanton, Calif., said about 75 users have signed on to test its satellite network. There are no plans to reduce the classroom training it already offers, the company added.

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Cabletron Systems Spins Off Software Unit

BY SAMI LAIS

Cabletron Systems Inc. last week cut many of the ties that bound its software and hardware divisions by spinning off the unit that develops its Spectrum network management software.

Spectrum users can expect support to continue as before, but integration of the tools with hardware from other network vendors should improve, said Cabletron Executive Vice President Michael Skubisz, who will head the new entity, which will be called Spectrum.

Durham, N.H.-based Spectrum will work more closely with network hardware vendors "that have traditionally been Cabletron competitors," Skubisz said.

That was welcome news to Daniel Speers, senior network engineer at Jefferies & Co. in Jersey City, N.J., and a user of Spectrum Enterprise Manager, Cabletron's high-end network management tool.

Although software "from other vendors fits in very nicely [with Spectrum Enterprise Manager], my biggest complaint has been that the competition between Cisco and Cabletron meant that Spectrum's integration with Cisco hardware wasn't as good as it could be," Speers said.

For example, Spectrum has management models for Cabletron's SmartSwitch routers and Cisco Systems Inc.'s Catalyst switches, he said, "but it took a long time for them to come out with the one for the Catalyst." Speers said what he hopes to see is "the ability to manage [other vendors'] hardware along about the time the hardware becomes available."

A Positive Move

He has reason to hope, according to Elisabeth Rainge, an analyst at International Data Corp., a Framingham, Mass.-based research firm. Users should feel reassured, she said, because although Spectrum has been a technically strong product, the split will open doors to improve integration with a greater range of hardware.

"A management software company should be agnostic when it comes to hardware[1]— a model of cooperation," Rainge said.

Development of the Spectrum tools will focus on modeling the desired performance of network hardware and warehousing network management data such as the amount of data transferred and the number of collisions and errors, Skubisz said.

The split is Cabletroo's latest move to staunch the flow of red ink. The company posted losses of $22.5 million for the quarter ended May 31, compared with losses of $154.6 million in the same quarter last year.

MORE ONLINE

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Bluetooth Wireless Links Draw Interest

But sharing files, security a worry for some

BY MATT HAMBLEN
NEW YORK

BLUETOOTH, the code name for radio technology that will wirelessly link small computing devices within 30 feet, attracted attention — as well as security concerns — at PC Expo last week.

Intel Corp. provided a booth demonstration of two laptop computers equipped with prototype radio cards "talking" to one another at speeds nearing 300K bit/sec.

Intel and other large computer companies in May last year started the Bluetooth Special Interest Group, which now involves 800 companies worldwide. The group is creating an open Bluetooth standard that lets all types of cellular phones, handhelds and PCs transmit voice and data wirelessly at up to 1M bit/sec. within a radius of 30 feet.

Vendors said products will begin to appear in less than a year. 3Com Corp. expects to produce a $100 Bluetooth modem card for laptops by the first half of next year.

"There's no question people are waiting for something like Bluetooth," said Michael Dudek, director of information technology operations at CBS Inc. in Pittsburgh, where handheld computers are showing up regularly. "People want ease of use and mobility with computing, and this would do it."

Collaboration

With Bluetooth, a worker could enter a room and wirelessly transmit data from a handheld device to a printer or a PC and collaborate with nearby colleagues.

"Bluetooth sounds nice, but the biggest concern is sharing files and security," said Scott Olsen, an IT associate at Warburg Dillon Read in Stamford, Conn.

Security concerns about Bluetooth can be overcome with encryption software, analysts said.

Bluetooth also lets any type of digital phone transmit wirelessly from the handset to a Bluetooth connection point and then operate over a company's wireline phone network. That's much cheaper than paying cellular rates. ●

JUST THE FACTS

Bluetooth

What is it? A special interest group of 800 companies, including Intel Corp.

What are they doing? Developing standards for a short-distance radio technology that would connect all types of devices up to 30 feet apart.

When will products ship? The first products are due next year.

More Power To Handheld Devices

PC Expo features products to extend wireless access

BY MATT HAMBLEN

Among the highlights at PC Expo in New York last week were products that extend computing power to handhelds, cellular phones and other small devices and a commitment from Microsoft Corp. to extend wireless access to handhelds based on its Windows CE operating system.

Microsoft's Chief Operating Officer Robert Herbold told attendees in his keynote address that through Windows CE, "every device with a screen will connect to the Internet." He added that people should be able to "do what they want, anywhere and on any device."

Connecting Kit

Building on that vision, Microsoft said it will ship a wireless communications kit for less than $100 in September. It will consist of a cable and a compact flash card to connect a Windows CE-based handheld with digital phones and include client software from AvantGo Inc. in San Mateo, Calif. Microsoft is developing a software wizard to guide users through setup.

Analysts said the wireless kit could offer greater flexibility to companies than the wireless Palm VII announced in May by a division of 3Com Corp. in Santa Clara, Calif. That product requires users to subscribe to a special service through a network provided by BellSouth Corp. in Atlanta. Microsoft is working to find carriers to sell its kit, which allows users to keep their own e-mail address.

Also at PC Expo, 3Com announced a cellular modem PC card that allows laptop users to connect to corporate networks and the Internet through many analog cellular and digital phones and via standard phone lines. It will sell for $229 beginning in July. ●

Lotus Notes Users Seeking Thin Client, Web Browser Feel

Interest high in technology to make Notes thin client

BY DOMINIQUE DECKMYN
SAN FRANCISCO

Lotus customers aren't rushing to implement the new Notes Release 5 client. Instead, they're opting for a thin-client approach for their new Lotus Domino applications.

Developers at Lotus DevCon last week applauded Lotus Development Corp.'s moves to put the Web browser on a par with Notes as a client to the company's Domino server. Lotus unveiled Domino Runtime Services (DRS), which is expected to enter beta testing in the fourth quarter.

It will allow browsers to access Domino applications even when disconnected from the network. DRS works by installing a minimal version of the Domino server on a remote PC. When the PC is hooked back up to the network, data is synchronized between DRS and the Domino server.

"It practically turns the browser into the Notes client," said Brad Hertenstein, manager of Web services at executive search company Romac International Inc. in Tampa, Fla.

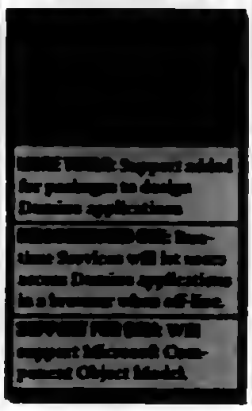
It will save Stephen Daly, manager at Whittman-Hart Inc., a consulting firm in Cincinnati, the "expense of installing a Notes client out there [for mobile users]."

The Notes R5 client offers a completely redesigned, Web-like interface, a built-in browser and a personal portal called the Notes Welcome Page.

Jonathan Penn, an analyst at Giga Information Group Inc. in Santa Clara, Calif., said R5 has some compelling features, but many users find it "confusing and cluttered." Few companies plan to implement it this year, mainly because of Y2K-related restrictions, he said.

Mitch D'Arlon, manager of knowledge applications at The Aerospace Corp. in El Segundo, Calif., said his company is "trying to move more and more to a browser look and browser access" for its Domino applications. However, D'Arlon said he's not ready to jettison the Notes client for applications that require strong security features. Eric Harding, a senior systems engineer at the Concord Tech Center of Bank of America in Concord, Calif., said the bank is about to roll out Domino R5, but it may be several years before its tens of thousands of Notes 4.5 users get upgraded to the Notes R5 client.

Though some applications still require the Notes client, "it's easier for us to just develop for thin client," he said. ●



Office Suite Rivals Hang On

BY DAVID ORENSTEIN
NEW YORK

Office suite makers Corel Corp. in Ottawa and Lotus Development Corp. in Cambridge, Mass., showed continued signs of life last week, but users at PC Expo said they have had to resist corporate preferences to use the dominant Microsoft Corp. Office software.

At the show, Lotus announced Version 9.5 of its SmartSuite productivity software and Corel showed off its new Office 2000 suite. Corel was also able to strut in with a much improved financial performance — a profitable quarter ended May 31 with $9.2 million in net income, compared with an $8.3 million loss in the same quarter a year ago.

But both companies are under the thumb of Microsoft, except where individual end users resist. On retail shelves so far this year, Microsoft Office has accounted for more than 83% of the units sold, Corel more than 15% and Lotus less than 2%, according to PC Data in Reston, Va. Corporate licenses tend to run even more heavily in Microsoft's favor.

Abe Tatosian, a national account manager at Premiere Radio Networks in New York, said he uses Lotus SmartSuite because he prefers the Freelance presentation software to Microsoft's PowerPoint. But the corporate standard at Premiere is Office, he said. ●

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BRIEFS

Online Chemical Trader Bought

Philadelphia-based PetroChemNet Inc., an Internet-based information and communications service for the chemical industry, has acquired ChemMatch Inc., a real-time online trading service for chemical products. The combined company is targeting the industry's 5,000-plus producers, traders and industrial buyers.

AMD Ships K7, Announces Loss

The same day that Advanced Micro Devices Inc. in Sunnyvale, Calif., announced that it is shipping its newest and most important processor, the K7, it also announced that it expects an operating loss for the quarter of about $200 million on revenue of about $800 million. AMD Chairman W. J. Sanders blamed the loss on cuts in the price of the company's K6 processor.

HP Smart Card Kit

Hewlett-Packard Co. plans to announce today a $99 smart-card kit for securing data on laptop computers. The kit creates a security system that requires a user to insert a smart card in the PC slot and type a password before software is loaded. Other smart-card protection products don't prompt for passwords until software is loaded, according to HP.

Sun to Continue Netscape Products

Sun Microsystems Inc. last week announced that it would continue development of Netscape Communications Corp.'s Mission Control browser and e-mail management tool suite. Sun is co-developing products with Netscape under a three-year deal it struck with America Online Inc., Netscape's parent company.

Banc One Goes Online

Banc One Corp. in Columbus, Ohio, launched a separate Internet-based bank (www.wingspanbank.com).

Dell Sees PCs Thriving

Says problems at Compaq are related to high cost structure, Digital acquisition

DELL COMPUTER Corp. Chairman **Michael Dell** pronounced the PC alive and well last week, dismissing comments by analysts and other PC makers' executives that the PC era is over.

"The personal computer is more vital than ever in the workplace and in the home, and I believe that trend will continue unabated," Dell told reporters at a PC Expo reception in New York last week. PC sales will increase, following an increase in production and sales of computing appliances such as wireless devices and pagers, he said.

Dell fielded questions from *Computerworld* reporter Matt Hamblen on a range of topics.

Q: Given your confidence about the PC market, does Compaq Computer Corp.'s plight bother you at all? [See story, page 30.]

A: They're in a very tough situation, with a cost structure that's not competitive. And I think the Digital [Equipment Corp.] acquisition has been difficult to cope with.

Q: Compaq is adopting and beefing up a direct-sales model. Will that help?

A: Yes, but they're doing it 15 years after we started. I think their operating cost structure is almost twice what ours is, and that's without their [distribution] channel. So if you add their channel costs, it's even worse. They turn [over] their inventory seven, eight times a year vs. our 60 times a year. They're on a whole other planet in terms of efficiency — and it's the wrong planet.

Q: Will Compaq still be a big competitor of Dell's going forward?

A: Well, we've passed them in a number of markets — [the] business market in the U.S. and workstations globally. We now have a 20% market share in servers; certainly, on a profitability basis around the globe, we're well ahead of Compaq. Compaq, IBM and [Hewlett-Packard Co.] are similar in [their use of] indirect distribution models, and their cost structures are significantly higher than ours and don't make money in the PC business.

Q: Will Dell enter the handheld computer market?

A: The handheld is not a focus for us right now in terms of our R&D.

Q: With wireless access and the Internet growing, is that wise?

A: Handhelds and two-way pagers are great products. My view is that [Wireless Application Protocol]-enabled phones and set-top boxes and computing in your car are essentially companions that enhance your use of information, while the PC kind of sits in the center of that universe.

Q: A commission is now convening to address Internet taxation [see page 6]. Where do you stand on the issue?

A: First, I don't think there should be taxes on Internet transactions that don't exist in the physical world. And anything taxed in the physical world should be taxed on the Internet.

DELL COMPUTER'S Michael Dell: "The handheld is not a focus for us right now"

Second, I don't think it's a state-to-state debate. It's a bigger debate. It's very easy for Amazon.com to move their server from Seattle to Vancouver. The states can have all the debate they want, and yet the server is in Canada. So you have to really consider this in terms of how the Web is used. When you go to a site, do you know where that server is? No. You have to think of Internet taxes not in terms of the U.S., but in terms of the world. The U.S. is not going to exit the globalization scene while we have this tax debate. ◗

Web Porn Cases Spark Surveillance Debate

Reactive mode not enough, attorney warns

BY DOMINIQUE DECKMYN AND CAROL SLIWA

Several high-profile cases of offensive material being found on office computers have reignited the debate over how closely firms should monitor employees' PC and online activities.

Last week, the executive director of the Pine Street Inn, a homeless shelter in Boston, reportedly resigned abruptly amid accusations that he stored pornography on his office computer. The shelter refused to confirm or deny the reports.

The dean of Harvard Divinity School in Cambridge, Mass., lost his post in November amid similar allegations. And last month, 28 employees of brokerage house Edward Jones & Co. in St. Louis were disciplined and 19 were fired for sending offensive e-mail messages.

Legal experts said it isn't enough for a company to have a clear, written policy on PC or Internet usage. They emphasized that the policy must also be communicated to workers and enforced if it's to have any value in protecting the organization from legal liabilities.

"We recently had two people fired because they printed off objectionable material on the company printer," said an information technology manager at a large U.S. food company. The company has a written policy but doesn't have a systematic monitoring program in place, said the manager, who declined to be named.

Jim Bruce, a cyberlaw partner at Wiley, Rein and Fielding in Washington, said such a reactive approach may not suffice. In a sexual harassment case, for example, the presence of pornographic material on any system in the network may suggest that a company tolerates such material and may help a plaintiff establish a pattern of sexual harassment, Bruce said.

Eric Greenberg, director of management studies at the American Management Association in New York, said monitoring e-mail and Web usage is like "walking past workers' desks to see whether people are doing their jobs." Electronic surveillance is merely "a productive way of doing it," he said.

"Obviously, if there is a policy, you have to be able to enforce it," said Fred Siedenburg, information systems manager at the U.S. Naval Air Facility in El Centro, Calif. The base has software in place to monitor Web usage, and Siedenburg is evaluating software to automatically check e-mail messages for objectionable content. ◗

Net Surveillance Rising

U.S. corporations are increasingly keeping an eye on workers' computer usage

Base: Survey of 1,054 human resources managers

SOURCE: AMERICAN MANAGEMENT ASSOCIATION SURVEY, JANUARY 1999

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ERICSSON

Continued from page 1

Users Pop Hood on App Hosting

of our time and resources," said Chuck Rush, global network architect at McDonald's Corp. in Oakbrook Terrace, Ill.

"It's time for large companies to take a close look at ASPs because of the potential cost savings alone," Fey added.

Savings from opting for an application service provider over running applications internally could hit 40% to 60%, according to TeleChoice Inc., a Boston consultancy.

But analysts warn the initial payoff will be lower because many providers have to make substantial up-front investments to get moving.

The projects being considered include the following:

- McDonald's is considering application service providers for handling its worldwide Notes operation but first wants detailed pricing information and data on what service levels will be provided and how users worldwide will be supported, Rush said.
- Memphis-based FDX Corp., the holding company for Federal Express Corp., is considering offering hosting, supply-chain and other applications to internal and external customers, said Chief Technology Officer Rob Carter.

PMI MORTGAGE'S JIM FEY wants proof ASPs can deliver

Companies have grown a lot more comfortable with outsourcing, analysts said, which is helping to drive interest. "Ten years ago, who would have imagined that companies would outsource their entire IT infrastructure?" said Tim Bourgeois, an analyst at Kennedy Information LLC in Fitzwilliam, N.H. "The ASP model is really just outsourcing in a red dress instead of a blue dress."

Forrester Research Inc. in Cambridge, Mass., projects that the application service provider market will be worth $6.4 billion by 2001, while International Data Corp. (IDC) in Framingham, Mass., projects that the value of high-end service provider-hosted applications alone will reach $2.1 billion by 2003.

As evidenced by last week's flurry of major new developments, the potential market for these services is so huge that players from all segments of the industry are jumping in (see related story, this page).

A provider uses a wide-area network equipped with servers to rent hosted applications, ranging from e-mail to enterprise resource planning (ERP) suites. Application service providers can be telecom carriers, Internet service providers and even hardware vendors.

For application hosting to work, providers will need flexible licensing deals with software vendors so they won't have to make huge investments up front before they have an idea of demand, analysts said.

Traditional outsourcers don't seem to be too concerned about service providers taking their business. Carol DeMatteo, a spokeswoman for Keane Inc. in Boston, said the IT services firm has no plans to enter the provider market. "We feel we can do a better job ... with our current services," she said.

The trick for users is to figure out which application service providers will best serve their needs.

Application Service Providers

PROS	CONS
■ Lowers cost	■ Market is still forming
■ Reduces staffing needs	■ Pricing hasn't been set for large users
■ Lets IT focus on core business	■ Questions about bandwidth, security and service
■ Provides better support	■ Shortage of application expertise

Users need to look beyond basic pricing, infrastructure, support and security issues, advised Rich Brewer, an IDC analyst. "Make sure ASPs can back up their data, [and] have a disaster-recovery plan tested and in place, a robust help desk and the ability to grow as your business grows," Brewer said.

But for now, some IT executives are more focused on simplifying application service and maintenance.

For Dick Hudson, vice president of MIS at Global Marine Corp., an offshore drilling contractor in Houston, the major appeal of a service provider is "not having to install new releases every year." Because Global Marine uses PeopleSoft Inc. applications and doesn't do a lot of customization, Hudson thinks the company might be a good fit for a provider.

"I would be willing to pay an ASP about what I'm paying now for annual maintenance to run the app," Hudson said.

Who will customize hosted applications is another key issue to consider.

"This issue hasn't really been dealt with, but I'd imagine ASPs with the expertise would want to play some role to increase business," said Christine Heckart, an analyst at TeleChoice.

Sander Thomassen, vice president of systems development at Guy Carpenter & Co., a reinsurance firm in Seattle, said he thinks a service provider could fit the bill when a big company enters into a joint venture or spins off a new division and needs applications quickly. "The idea has merit as a way to get something going quickly," Thomassen said.

Eastman Kodak Co. would consider a service provider for some of its applications but isn't sure if a provider could handle a complex application suite such as ERP, said Eric Pylko, global infrastructure coordinator at the Rochester, N.Y.-based company.

Most of the users who expressed interest in the service provider option said they thought basic applications such as e-mail and calendaring would be the early targets for hosting because they require revisions but limited customization. ●

App Hosting Activity Rising

The fluid application service provider market continued to gel last week with key developments on several fronts, including the following:

- The ASP Industry Consortium, a group launched in May to sponsor research and foster standards, last week added 31 members, including Microsoft Corp., Sprint Corp. and US West Inc., bringing the head count to 56 companies.
- Qwest Communications International Inc. and professional service giant KPMG LLP launched a joint venture to develop application service provider hosting and management services. The unit will offer hosted enterprise resource planning, customer relationship management and Microsoft BackOffice applications and will have 450 certified applications specialists.
- Microsoft invested $50 million in Internet service provider Concentric Network Corp. in part to fuel the provider's plans to host an array of Microsoft applications beginning later this year.
- Storage Technology Corp. outlined plans to provide a variety of pay-as-you-go storage systems designed in part for Internet service providers looking to offer hosted services.
- IBM Global Services announced a series of hosted applications targeted initially at small and midsize businesses.

– *Bob Wallace*

SEC Ponders New Y2K Readiness Rule

Agency could shut down brokerages that can't prove millennium readiness by Oct. 15

BY THOMAS HOFFMAN
NEW YORK

The Securities and Exchange Commission is weighing a new rule that would require brokerages to verify their year 2000 readiness by Oct. 15 or risk being shut down.

The plan, disclosed by SEC Commissioner Laura Unger at a Securities Industry Association Y2K conference held here last week, would require directors at brokerages to sign a certificate confirming that their firms will have completed their year 2000 remediation work by mid-October.

That shouldn't be a big problem on Wall Street because most brokerages will have finished their remediation work by June 30, said Elizabeth Nappo, vice president of global operations at Goldman, Sachs & Co. in New York.

Though it's within the SEC's power to shut down any brokerages that don't comply with the proposed rule, Unger said taking such drastic action "is not something we want to do or expect to do on a broad scale."

THE SEC'S LAURA UNGER: "Not something we want to do"

The agency will be meeting to vote on the proposed rule "very soon," Unger said. If approved, the rule would go into effect immediately.

The move is the latest step by the SEC to get companies to disclose more pertinent information about their year 2000 projects. In October, the SEC fined 37 brokerages for failing to file disclosure reports on their Y2K projects.

Still, Wall Street analysts say they wouldn't expect the SEC to shut down many, if any, brokerages. Such a move would "erode" investors' confidence in the readiness of the U.S. securities industry, said Rick McDonald, year 2000 project director at D. A. Davidson & Co., a brokerage in Great Falls, Mont. ●

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U.K. Firm Hopes to Cash In On Knowledge Management

Born of desperation, homegrown system now robust enough to market to others

BY DOMINIQUE DECREMYN

BRITISH ENERGY company BG PLC's knowledge management project was born two years ago out of necessity. The former, state-owned British Gas was turning private and downsizing at its research arm, BG Technology, cutting staff from 1,800 to 600.

But its task — to provide the rest of the company with research and technology — remained unchanged.

Now BG Technology, based in remote Loughborough, near Leicester, England, hopes to turn a project that sprang from survival instincts into a money-maker by selling its application to others. A prototype of its third-generation knowledge-management system will debut in July.

BG Technology needed to salvage the knowledge it had built up in the face of massive departures and to dramatically increase its productivity. "We only started calling it a knowledge management project later on," said Martin Vasey, a top information technology manager at the BG Technology unit.

MARTIN VASEY: Gradual approach won users over

BG Technology decided to set up a system that would allow its own staff as well as BG's 16,500 workers to easily retrieve research documents on such topics as gas exploration and environmental protection from a wide variety of sources — all via a Web browser.

The system needed to include scanned paper reports, documents stored in Lotus Notes and PC file systems and data from Oracle Corp. databases. It also needed to provide a search engine that could recognize concepts rather than just keywords. It had to respect Notes security down to the document level. The company chose RetrievalWare, a software tool from Excalibur Technologies Corp. in Vienna, Va., to handle that task.

To win over users, BG opted for a phased approach. The first-generation knowledge-management system brought workers together in teams (who shared a common goal) and communities (who shared a common interest such as chemistry) and gave them the tools to store and share their documents. The second generation added advanced search capability across teams and communities. Both generations are now being rolled out at BG Technology and are ready to be introduced to the rest of BG.

"The key thing is: It has to make the things people are doing today easier to do," Vasey said. The knowledge management system "has to make it easy for you to keep your own information," he added. "The sharing [with the rest of the team] has to be an added benefit, and the corporate benefit comes wheo all groups can share the same information. If you try to force people to change the way they work, they'll reject it."

Vasey said he hopes that the third-generatioo project will lead to an integrated knowledge management system the company can market to other companies. It will add external data feeds and advanced analysis tools such as ThemeScape from Bellevue, Wash.-based Cartia Inc. and then lead to a system that automatically alerts BG to business opportunities or points the company to potential business partners.

Daniel Rasmus, an analyst at Giga Informatioo Group Inc. in Aliso Viejo, Calif., said BG's phased approach "is along the lines of what we are recommending. The technology is never the problem; the hard part is getting people to share what they think."

One user of the system, downstream technology manager Mark Taylor, said it saves him a half-day every week in his job of communicating BG Technology's research and development work to the rest of the company. "It cuts down on pointless e-mails, which no one tends to read [anyway]. Now I can be sure that people who need the information will be able to find it," he said.

Project documents	Items produced by project teams as part of their work
Project archive	Past project documents
Published reports	More than 10,000 scanned and indexed pages from more than six years of proprietary research
Specialized databases	Specific technologies produced for BG customers
Competitor intelligence	Collected information on competitors

E-Commerce Driving a Redefinition of GM

CIO: Focus must be on customers, youth

BY KATHLEEN MELYMUKA
CHICAGO

E-commerce has changed the rules of information technology project management. To succeed in the new environment, project managers have to redefine the customer, redefine the project and embrace youth, according to Ralph Szygenda, CIO at General Motors Corp.

Speaking to an audience of about 1,000 project managers at ABT Corp.'s Project Leadership Conference in Chicago, Szygenda reflected on how e-commerce has put the focus on the car buyer. "Your customer is not the internal customer anymore," he said. "Everything that you do affects the external customer."

The traditional carmakers' goal of optimizing manufacturing to beat the competition is no longer useful, Szygenda said. "We're focusing more on understanding the end customer than worrying about what Ford or Chrysler are doing."

In the past, Szygenda said, GM treated each sale separately and had no way of knowing if a sale was a customer's first Cadillac or 10th. Now the company is collecting and consolidating 20 huge databases of customer information so that a customer's entire car-buying history will be linked to every order.

In the past, GM built cars first, shipped them to dealerships and then tried to entice customers to buy what was in stock. Now "customers come in from the Internet knowing the cost of vehicles. There's no negotiation," Szygenda said.

GM CIO RALPH SZYGENDA: Cater to the "external customer"

So GM is moving to build-to-order and Internet direct sales, starting with 15 major pilot programs. Szygenda said he hopes to integrate the direct-sales channel throughout the company in 12 to 18 months. "Someone else will do the [customer-facing] front end and dictate to us how we have to do our end" if he doesn't meet or beat that timetable, he said.

For anyone involved in e-commerce, Szygenda said, the new model is the 60-day business. The ability to move swiftly is essential because competitors like Autobytel.com, ETrade Group Inc., eBay Inc. and Priceline.com can "change the way they market and change distribution channels overnight," he said.

As a result, IT project managers have to redefine projects. Rather than having ambitious, long-term goals, today's projects need to deliver incremental value almost immediately and theo build on that, he said.

To move at that speed, project managers have to take a leap of faith beyond their analytical mind-sets and begin to use their intuition, much as top athletes do, Szygenda said.

Making those kinds of changes isn't easy, he conceded. Responding to a question about which GM sector showed the most resistance to e-commerce, he said "everybody. There's total fear."

Embracing youth is one way to get the company moving forward. The people who "get" the Internet are people who were born and bred on new technology, Szygenda said. Most people over 40 lack the intuitive grasp of the younger generation, he added.

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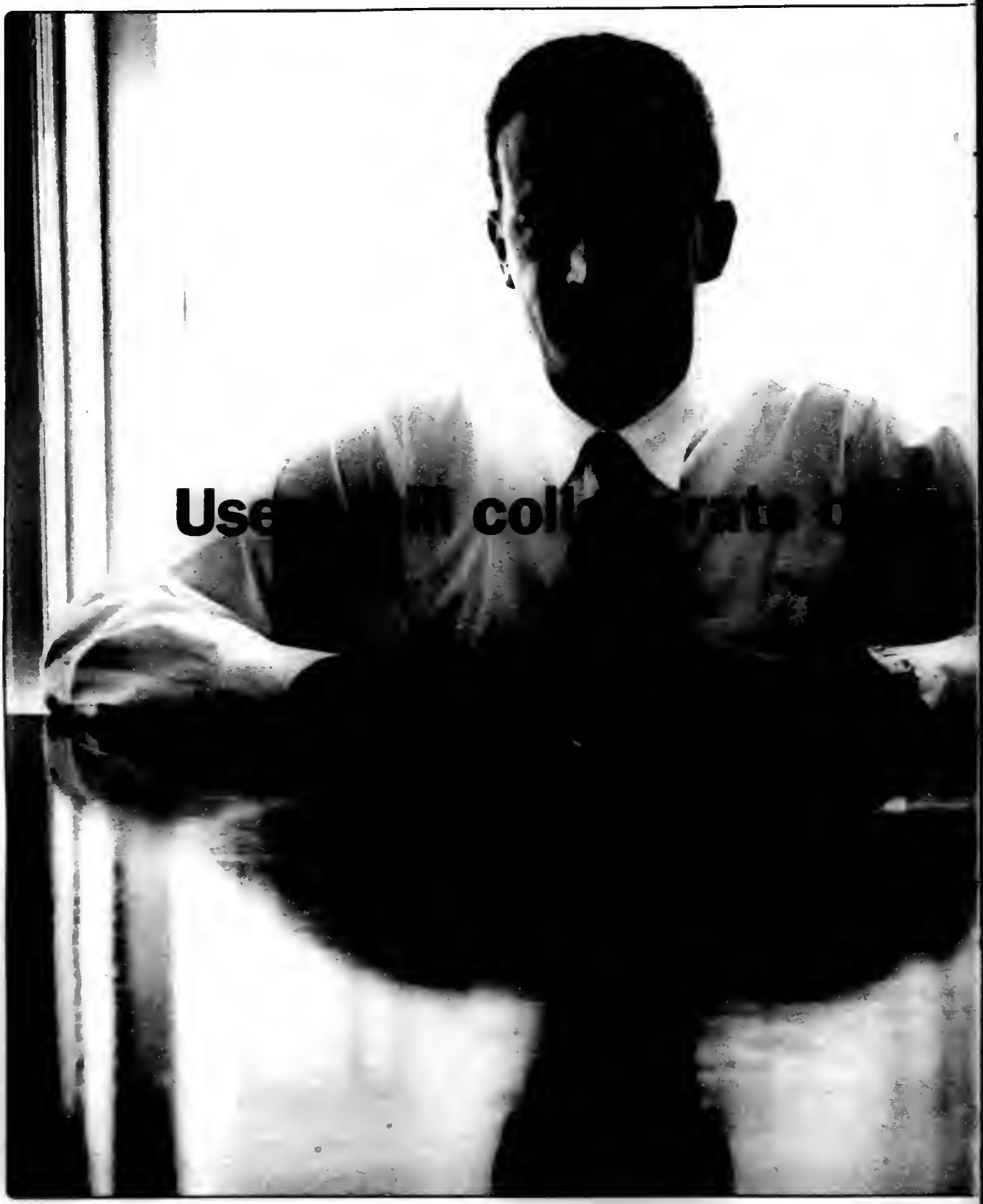
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Client/Server Outsourcers Changing Pricing Methods

New fee models cover software upgrades, number of users served

BY BARB COLE-GOMOLSKI

MAINFRAMES may not be dead. But outsourcing contracts based on them are on their way out.

Under pressure from users, outsourcers have begun to alter the way they charge for client/server services, making it easier for users to compare bids and to determine if they're getting what they pay for.

Because the traditional formulas used to determine fees in the mainframe arena don't apply to the client/server space, a variety of pricing models have sprouted for determining the cost of managing client/server systems.

Vendors have typically set prices based on the number of users or desktops, then added charges for things like software upgrades and help desk calls. Customers have balked at this ad hoc method, and outsourcers are responding with fees that include software maintenance and upgrades, according to Peter Bendor-Samuel, president of Everest Corp., a Dallas outsourcing consulting firm.

Cost Division

Another recent shift is the separation of client and server costs, analysts said.

On the server side, outsourcers aren't trying to apply the mainframe pricing model — which is typically based on CPU cycles and disk space — to distributed servers. Instead, outsourcers are now more interested in the number of users the server supports and the importance of the application.

"We've gone from mainframes to client/server, and the old [pricing] rules just don't make sense anymore," said Janis Emplit, CIO at Advantica Restaurant Group Inc. in Spartanburg, S.C. Advantica is renegotiating its contract to pay vendors based on the number of distributed servers and their various service levels. "Right now, I get an invoice for $3 million a month, but I don't really know what I'm getting for that," Emplit said.

Though the move is good for users, it's tough for large outsourcers like IBM Global Services, Electronic Data Systems Corp. and Computer Sciences Corp. (CSC). "They have a mainframe mentality," Bendor-Samuel said.

CSC and EDS declined to discuss their client/server pricing, but both said those types of services tend to be part of large, long-term deals. IBM said the same thing, but a spokeswoman at the company said it's trying to standardize pricing for such services.

During a recent bidding process, "I dealt with three vendors who all priced their [client/server] services somewhat differently," said Debbie Fuchs, director of human resources information systems at J. M. Huber Corp., a manufacturer in Edison, N.J., that recently outsourced the development and maintenance of its PeopleSoft Inc. human resources information system to re-Source Partners in Columbus, Ohio.

In one case, the base price included maintaining the hardware, but it didn't include user support, Fuchs said. One vendor tacked on charges for every paycheck that would be generated with the PeopleSoft system. "It's kind of a mishmash because they price their services a la carte," Fuchs said. To level the playing field, Huber came up with a list of requirements that had to be included in all bids, she said.

Hilton Hotels Corp. in Beverly Hills, Calif., pays an outsourcer to manage its servers based on how mission-critical the system is.

"We have a matrix of service levels, and each level basically has a different price," said Joseph Durocher, Hilton's CIO. That works better than the previous method of paying for server management based on CPU cycles and disk space, Durocher said.

JUST THE FACTS

Pricing Shift

The emerging model for client/server outsourcing typically involves:

- Separation of the client and server in the bid
- A per-client charge that includes software upgrades and end-user support
- Per-server pricing based on the number of users or importance of application

Manufacturers Use Web To Share Supply-Chain Data

Goal is to cut costs and boost sales

BY CRAIG STEDMAN

AlliedSignal Inc.'s avionics unit sometimes needs two weeks just to tell customers when their orders can be filled. But that kind of response won't cut it in the world of e-commerce.

So next month, the $1.5 billion division, which makes products such as radar systems and aircraft lighting, plans to start testing Internet-based software that's expected to speed up the process of getting production commitments from suppliers.

AlliedSignal is among the vanguard of manufacturers looking to use supply-chain management software and the Web to exchange business data and collaborate on demand forecasting and production planning with suppliers, customers and distributors. The goal is to cut costs and boost sales.

No one expects that to happen at Internet speed. For example, AlliedSignal Avionics & Lighting is working with three suppliers now and hopes to start pilot projects with 50 to 60 by year's end. Purchasing managers will still check on product availability via phone calls and faxes in case the software doesn't work. "We're going to start kind of small," said Ken Vlach, vice president of integrated supply-chain operations at the avionics unit in Olathe, Kan. "But this is no longer theory. We're touching it and feeling it now."

Technology to make supply-chain collaboration possible is arriving in droves. This month, products were announced by four vendors, including I2 Technologies Inc. and Manugistics Group Inc. Meanwhile, a group of users and vendors working as part of the Voluntary Interindustry Commerce Standards Association plans next month to update its year-old collaborative planning guidelines and release an implementation road map for setting up pilot projects.

It will also target the guidelines at a wider group of users after focusing on retailers, which were quickest to grasp the concept [News, June 14].

Heineken USA Inc. was one of the first manufacturers to join. Late last year, the White Plains, N.Y., beer company rolled out a Web-based system that takes orders from its 450 distributors and does collaborative forecasting and planning via supply-chain software from Atlanta-based Logility Inc.

Heineken had to reorganize its planning department and hire new employees to make the system work. But the 12-week lead time it needed to fill orders has already been reduced by up to 50%, said Andy Thomas, vice president of operations planning.

AlliedSignal's avionics unit expects supply-chain collaboration to help chop its order-to-delivery cycle times by 25% and its inventory costs by 20% annually, Vlach said. It's testing software made by Ottawa-based WebPlan Inc. and others.

The Timberland Co., a Stratham, N.H., footwear maker, is launching small-scale collaborative planning tests this summer using software from Manugistics in Rockville, Md.

Exchanging data on the Web requires "a different mind-set, but we feel that's where we need to go," said Yusef Akyuz, Timberland's vice president of information services.

JUST THE FACTS

Supply-Chain Collaboration

What it is: The use of Internet-based supply-chain management software to automatically place orders, exchange sales data and create demand forecasts, production schedules and inventory plans.

Potential benefits: Increased sales; savings on inventory and labor costs; reduced order-to-delivery cycle times; improved ability to customize products for retailers and other buyers.

Challenges for users: Establishing enough trust to share sensitive business data; defining common ways of doing business online; ensuring that the software is fed accurate information.

It's More About Business Than Technology

Supply-chain collaboration software is popping up all over the place these days. But technology is only part of the equation for users.

Potentially more daunting is getting different companies to agree on business issues such as how much information should be shared and how to secure it.

"Vendors like to say collaboration is easy because it's Web-enabled," said Karen Peterson, an analyst at Gartner Group Inc. in Stamford, Conn. "But it's more about business processes than technology."

Establishing trust among companies and getting them to accept the idea of more automated business dealings are key challenges, said Ken Vlach, vice president of integrated supply-chain operations at AlliedSignal Avionics & Lighting.

"That's a whole new world of relationships," he said. "I'm still learning what I want and what I need to do to be successful."

—Craig Stedman

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Hewlett-Packard, EMC Part Ways Over Reseller Deal

BY JAIKUMAR VIJAYAN

Hewlett-Packard Co. and storage vendor EMC Corp. last week formally ended a relationship that has been heading south for several months.

The two companies agreed to terminate a reseller agreemeot, signed in November 1995, under which HP used EMC's high-eod Symmetrix storage systems as part of its Unix server installations.

The move will have no effect on the warranties and service cootracts of HP customers who have already purchased Symmetrix systems, according to the statement that announced the breakup.

EMC also will continue to support and service the products and will continue to work with HP to ensure interoperability with future HP software and hardware.

The divorce has beeo imminent since HP signed a joint technology and manufacturing deal with Hitachi Data Systems in May. Uoder that agreement, HP will modify and sell HDS's high-end storage array products as part of HP's SureStore storage line.

HP claimed that one of the main reasons it made the move to HDS was that EMC's technology was aging.

"I think that was poor strategy on [HP's] part," said John McArthur, an analyst at International Data Corp. in Framingham, Mass. HP's decision to go with HDS products had little to do with the quality of EMC's technology, he said.

Taking Control

Instead, the core reason was that "HP wanted a storage product that was HP-branded," McArthur said. "By getting into an OEM agreement rather than a reseller agreemeot, [HP] felt [it] would have more control over the future direction of the technology."

"HP had approached EMC to be an OEM provider," said Rick Lacroix, a spokesman at EMC in Hopkinton, Mass., but "we refused because of the brand equity we had."

Geoff Kulesa, an HP program manager, said that in addition to being based on 10-year-old technology, EMC's storage architecture is proprietary.

Although sales via HP contributed to almost 13% of EMC's revenue of $1.13 billioo last quarter, EMC isn't backing off its financial targets for the current quarter, Lacroix said.

EMC will try to grow sales from similar reseller agreements, but it also hopes to do more direct business through its recently doubled, 2,000-person sales force, Lacroix said.

Also likely to help is that demand for storage products like EMC's is growing 25% annually, according to a recent study by Merrill Lynch & Co. The report projected EMC's current quarter would show revenue growth of 35%.

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AOL, Hughes to Build High-Speed Net Access

America Online Inc. said it would invest $1.5 billion in a General Motors Corp. equity security in a complex financial deal that ultimately will lead GM to put that same amount of money into a high-speed Internet service built with Hughes Electronics Corp. The deal also calls for Hughes to invest $1.4 billion to launch a North American satellite system for two-way broadband communications in 2002.

PalmPilot Sales Buoy 3Com Profits

3Com Corp.'s quarterly earnings rose 36% from a year ago, to $87.5 million on $1.4 billion in revenue. Sales of systems products, including its popular PalmPilot device, jumped 17% to $784.7 million, while sales of modems and other client access tools dipped 10%.

Cabletron Posts Loss

Networking vendor Cabletron Systems Inc. posted a $22.5 million loss, compared with a $12.7 million loss in the same quarter a year ago. The Rochester, N.H., company said after accounting for inventory write-offs and other expenses, it posted a $7.3 million profit. Sales were $349.5 million, down from $385.7 million for the same quarter last year.

Short Takes

NEWBRIDGE NETWORKS CORP. in Kanata, Ontario, said it would acquire Sunnyvale, Calif.-based STANFORD TELECOMMUNICATIONS INC., a supplier of broadband wireless products for $280 million.

SAP AG said its U.S. subsidiary now reports to executive board member Henning Kagermann instead of co-founder Hasso Plattner. Plattner – who shares the CEO job with Kagermann – will focus on an Internet software initiative announced last month (News, May 10).

ADVANCED MICRO DEVICES INC. warned investors that it expects to report a $200 million quarterly loss; the Sunnyvale company also released its K7 processor, call Athlon.

Compaq Counts Its Losses

Buildup of enterprise services key in rebound as company embarks on major reorganization

BY STEWART DECK

With Compaq Computer Corp. floundering, it may look like its $9.6 billion purchase of Digital Equipment Corp. 18 months ago was a costly blunder. But analysts agree that the acquisition was vital to Compaq growing beyond the fiercely competitive, margin-tightening business of PC sales.

For Compaq to begin growing successfully again, it has to continue to develop its offerings beyond PCs and better package the costly Digital services it bought, observers say.

Buyout Fell Short

Terry Shannon, an industry analyst and editor of "Shannon Knows Compaq," an Ashland, Mass.-based newsletter, said Compaq has needed new leadership and less bureaucracy to take advantage of what it acquired with Digital.

"Compaq got a world-class services organization [by buying Digital], and they've only grown it incrementally instead of exponentially. That's an area that could use more attention," Shannon said.

Services are Compaq's key to higher profits for two reasons: Business users are seeking all-in-one packages of products and services, and the support business doesn't carry the cutthroat margins of the PC business.

James Meyer, an analyst at Janney Montgomery Scott Inc., a Philadelphia-based investment firm, said Compaq's Digital purchase was strategically sound, but it hasn't done enough with what it bought. "Everybody [there] has been too busy defending their turf" to quickly set up thoughtful teamwork plans, he said.

Compaq's announcement two weeks ago that it was finally reorgaoizing itself amid pending quarterly losses sounded like good news to several observers.

Lower Inventory

Balancing a hybrid model of direct and indirect sales forces, pumping up its direct-sales teams and streamlining its distribution channels should all pay off in the long-term, said Art Russell, an analyst at Edward Jones & Co., a St. Louis investment firm.

"Reducing distributors will hold inventory down and speed up the turnover of product," Russell said. IBM, Hewlett-Packard Co. and Apple Computer Inc. have recently followed that model successfully, he added.

Rival Dell Computer Corp. has demonstrated that eliminating inventory is a key to better sales margins, said Robert Anastasi, an analyst at The Robinson-Humphrey Co. in Atlanta. Compaq's new plans to follow that model more closely are a strong step, he said, but it took some drastic reworking, including executive-level cuts, before the troubled company moved in that direction.

But too much upheaval can also cause users to question the company's health. William Spencer, an accounting software consultant and designer for WJS Consulting in Hyde Park, N.Y., said, "all this news doesn't help the image that you're dealing with a stable company. So much has happened at Compaq recently that it probably will impact Compaq's customers."

JUST THE FACTS

Compaq's Tough Road

Recent and proposed moves/events by Compaq include:

- Company reorganization, including layoffs
- Pending quarterly loss
- Trimmed distribution channels
- Executive departures
- Effort to sell AltaVista.com

Banyan Takes New Direction With Services

Focus on networking, directory, messaging to fuel revenue, growth

BY BARB COLE-GOMOLSKI

After a long and rocky history as a software company, Banyan Systems Inc. has decided to focus on information technology services.

The company last week announced that it is now doing business as Banyan Worldwide and has formed Banyan Worldwide Services, a division that will offer networking, directory and messaging services. The Westboro, Mass.-based company will continue to develop software, including its Switchboard Internet directory, but it expects services revenue to fuel its growth.

Banyan's services division has grown rapidly in the past two years. It employs about 250 consultants and already generates about half of Banyan's revenue, the company said. Target customers are large, international firms that have multivendor environments and are building applications that require a directory or security infrastructure, Banyan said.

"The direction [Banyan] is taking makes sense," said Charles Rutstein, an analyst at Forrester Research Inc. in Cambridge, Mass. Banyan has "marketable knowledge" in the areas it's targeting, he said.

However, the company faces some formidable challenges in moving into IT services in a bigger way, Rutstein said. Those include scaling up its services staff; competing against well-established services firms and networking and directory software makers; and adjusting to the lower profit margins of services, compared with software sales, he said.

MCI Invests In Wireless Data Provider

$350M for Metricom stake; Ricochet data services part of deal

BY BOB WALLACE

MCI WorldCom Inc. last week took a giant step toward filling out its near-empty wireless services portfolio by investing $300 million in wireless data provider Metricom Inc.

As part of the deal, MCI signed a five-year, $350 million nonexclusive deal to buy wholesale Metricom's Ricochet data service, which Metricom now offers at 28.8K bit/sec. in the U.S. and plans to offer at 128K bit/sec. starting early next year.

Ricochet lets mobile workers send and receive data from PCs equipped with wireless modems.

Los Gatos, Calif.-based Metricom will use MCI's high-speed data and Internet networks and support operations as it expands, MCI said. The $300 million investment doesn't give MCI a majority stake in Metricom because venture capital power Vulcan Ventures Inc. also announced $300 million in funding for the wireless data company.

MCI recently started building up its presence in the wireless services market by announcing plans to merge with paging kingpin SkyTel Corp. in a $1.8 billion deal (News, June 7).

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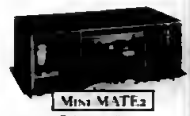

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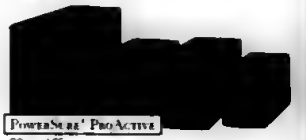

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Liebert

MARYFRAN JOHNSON

E-soap opera

WELCOME TO ANOTHER EPISODE of *As the Web Turns at eBay*, the hottest daytime media drama in cyberspace.

Opening scene: Sudden darkness falls on our feisty, freewheeling auction site, where hundreds of thousands of frenzied buyers are cut off from their supplies of bronzed gardeo frogs and Civil War memorabilia. A sharp sensation of déjà vu. A forest fire of flame e-mail. Reports of mass hysteria in certain isolated parts of the Midwest.

MARYFRAN JOHNSON is executive editor of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

Cut to a nervous, sweating company spokesman. "Please stand by. We are experiencing technical difficulties. Do not adjust your Web browser at this time."

Mootage of party scenes at rival Web auction sites. Executives form a conga line at Yahoo. Revelers on roller skates at Amazon.com try to do the Wave, but somebody trips, and they all crash into the warehouse bookshelves.

Fade to somber faces on-screen. Industry experts reminisce about other infamous outages. Remember the AOL blackout of '97? The ETrade and Ameritrade meltdowns? The Schwab.com stumbles?

"We mustn't forget that these businesses all survived and even thrived," one analyst says earnestly. "They got it: It's the technology infrastructure, stupid!"

Crowd shot: A veritable sea of outraged users, howling for accountability and answers. Who's to blame? Was it eBay's corrupted database? The neglected software patch from Sun? The mind-boggling lack of backup systems?

The screen fills with the face of a grizzled data center veteran named Al, clearly pained by the shocking revelations. "They had no backup? No hot standby? No disaster recovery plan?" He shakes his head, sighs deeply. "Kids today. Runnin' an e-commerce site like it was a PC network."

Reaction shots: IT managers around the nation anxiously watch Al, their minds racing. In the wake of eBay, top management is sure to ask them: This kind of megacrash couldn't happen to *our* Web site, could it?

Our backup is airtight, isn't it?

Isn't it?

Stay tuned . . .

GARY R. BACHULA

Commerce Dept. addresses the 'digital dilemma'

ON JUNE 30, U.S. Secretary of Commerce William M. Daley will release the culmination of two years of work by the department's Office of Technology Policy (OTP): a report titled "The Digital Dilemma: Building Infotech Skills at the Speed of Innovation" (*www.ta.doc.gov/reports*). Daley will announce new programs that the Commerce Department and private sector are undertaking to tackle the tough, ongoing issues of technology training and improving the poor public image of computer and engineering professionals. Those programs aren't the result of closed-door meetings of bureaucrats; they've emerged from a long-standing dialogue Daley and the OTP have had with the business community.

GARY R. BACHULA is the U.S. Commerce Department's acting undersecretary for technology. Contact him at public_affairs@ta.doc.gov.

Almost two years ago, at Daley's directive, the OTP took on the project of examining the country's growing need for trained IT workers. Our initial review of that issue was the report "America's New Deficit," released in September 1997. It suggested the problem needed more attention by stakeholders. Consequently, the OTP co-sponsored a national convocation in January 1998 in Berkeley, Calif., and went on the road to host a series of regional town meetings to further detail the challenges and seek possible solutions.

The OTP involved communities from Austin, Texas, to Boston and from Ellisville, Miss., to Seattle.

At the Seattle town meeting, Daley launched a new Web site (*www.ta.doc.gov/go4IT*) that serves as a public resource, listing many of the innovative initiatives highlighted in the discussions.

The site has since grown to list almost 300 ioitiatives.

For example, the New Orleans Center for Math and Science keeps its high school students one year longer, for a 13th grade. When they graduate, it's not only with a high school diploma but also with a technical certificatioo sufficient for a good first job. Its graduates have gone from working in fast food to fast IT.

In Ellisville, one discussion participant from another town told us how his city was keeping

good teachers. Educators are getting joint appointments. During the school year, the teachers teach school; in the summer, they return to business and industry.

That dual assignment achieves many goals: The students get the latest information from the working world, and teachers continue to have their skills upgraded and to have their salaries boosted by the higher summer pay. That enables them to fend off headhunters and stay in the teaching profession.

Despite the good news, one common complaint was the often-negative image of IT workers.

The stereotype of the computer geek or technology nerd is keeping people, especially teenagers, from embracing the idea of an IT career.

With this week's announcements, we hope to encourage more local initiatives and more young people to pursue technology careers. Partnerships are critical to addressing that challenge, enabling American business and industry to face the 21st century with a skilled workforce.

DAVID MOSCHELLA

DOJ vs. Microsoft: What we know, and what we don't

I SUSPECT I am not the only one who has pretty much tuned out of the day-to-day coverage of the Department of Justice vs. Microsoft trial. Like Ken Starr's investigation of President Clinton, the whole thing has gone on long enough that most people who care about the subject already know what they think. There have actually been very few surprises, and really, the only issue left is what the judge will decide. There's not much more we need to know.

DAVID MOSCHELLA is an author, independent consultant and weekly columnist for *Computerworld*. Contact him at [illegible]

We already know that, whether its practices were illegal or not, Microsoft's actions have had a devastating effect upon Netscape. AOL may have swapped $10 billion of its highly priced stock for the company, but, other than those acting out of pure anti-Microsoft resolve, how many serious Web users still prefer Navigator? And who even talks about Netscape's enterprise software anymore? Remarkably, the words *Netscape* and *Navigator* are already fading into the realm of nostalgia, like *VisiCalc* and *WordStar* during the Windows reign.

The defeat of Netscape has also taught us that it will take more than just an open-source philosophy to successfully take on Microsoft. Over the past year, Microsoft's Explorer team has clearly operated more rapidly and more effectively than Mozilla.org, Netscape's open-source browser movement. In the ongoing debate about whether the software design process should be more like the individual choices of the bazaar or the architectural vision of a cathedral, chalk one up for the cathedral.

As for Microsoft, we already know that Bill Gates and company have been singularly ineffective in countering the government's charges. Not surprisingly, Microsoft's attempts to show that it is not a monopoly have been mostly laughable. But it's now also undeniable that the company has used its control of Windows to punish its competitors and reward its friends. Perhaps worse still, the company image has been badly damaged. It's hard to think of a single Microsoft executive who has been consistently credible and effective.

We also already know that our government has failed to act in anything even resembling Internet time. First, there was the ineffective consent decree of 1994 that tried to clean up Microsoft's PC vendor contracts. Then, the current antitrust charges were filed in May 1998, with the trial finally beginning in October, only to be suspended in February for three months while the judge returned to other matters. Obviously, much has changed during this time, allowing Microsoft and others to argue that the charges have been superseded. But the main lesson is that we shouldn't expect computer-based trials to be resolved faster than any others.

Finally, we already know a great deal about how public opinion works in these situations. As with the impeachment trial of President Clinton, most people seem to agree that the charges against Microsoft are essentially true, but they often sharply disagree about whether anything serious should be done about them. And, as with the Clinton case, most people's views of Microsoft have solidified over time, with few noticeable shifts in public opinion.

The only thing we don't know is what Judge Thomas Penfield Jackson will eventually decide. Here again, the Clinton case may be instructive. The president was victorious in the court of public opinion, even though Judge Norma Holloway Johnson subsequently found him in contempt.

In Microsoft's case, public opinion is only indirectly relevant.

However, all signs suggest that Judge Jackson, like Judge Johnson, won't let Microsoft off scot-free. When that decision comes, we'll all tune in again.

READERS' LETTERS

The ethics of outsourcing

HAVING read "Breaking News About Outsourcing Is Tricky" [Business, May 31], I have a question: How could you have an entire article devoted to the subject without even once considering the ethical implications of withholding the information from the affected employees?

Jon Brock
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New CW format easier to read

I USED to read *Computerworld* back in the '80s and early '90s but have been away from it for the last few years. To clear out the IT cobwebs, I resubscribed and just got my first issue. Nice! It's much easier to read and digest the voluminous information you continue to provide. I must confess that I used to kind of dread reading the old version, but this new one's so well presented that catching up on IT issues is actually pleasant for a change. Thanks!

Tim Frazier
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Does token retraining equal discrimination?

WITH regard to the winding down of Y2K projects ["After Y2K: Will You Have Work?," Business, June 7], a cynic might say that demand for mainframers will remain strong in the next decade as companies clean up the messes that their frantic Y2K conversions are now creating.

But even if the case is otherwise, large companies may want to make an aggressive effort to retrain their mainframers if only to protect themselves: If a company is expending substantial resources trying to lure youngsters with the hot skill du jour while making only token efforts to retrain its senior employees, it can look an awful lot like age discrimination.

Perhaps *Computerworld* can find an attorney to write an article exploring the issue of how to demobilize a mainframe team.

Tony Hohenbrink
Columbus, Ohio
hohenbrnk@ibm.net

Battle-tested leaders have higher standards

I TOUCHED upon the same subject as "Battle Tested: Military Veterans Make Great IT Leaders" [Business, May 17] in my book *The Older Job Hunter's Guerrilla Handbook*, although from a different perspective. Military veterans routinely excel in business leadership roles, but the same traits that make them successful — severe self discipline, willingness to assume leadership and a demand for precision — cause them to be resented by younger workers.

Whereas the average veteran's attitude usually is "It is my duty to succeed," the younger worker's mind-set too often seems to be "If things get too rough here, I'll just take my programming tools and find another job."

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COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Allan E. Alter, columns editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 875-8931; Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

GEORGE ZACHARY

As IT managers form outsourcing start-ups . . .

BEING A venture capitalist puts you in a great position to spot industry trends. You can just look at the kinds of business plans that cross your desk and see if any patterns emerge.

In the past few weeks, I've seen a new twist in IT outsourcing. IT professionals in well-established companies are jumping ship to form their own IT outsourcing companies. It's not the CIOs who are quitting, but IT directors in their 30s and early 40s who run corporate intranets, help desks and financial information systems. And when they leave, they're taking along five to eight of their peers.

GEORGE ZACHARY is general partner at Mohr, Davidow Ventures in Menlo Park, Calif. Contact him at gzachary@mdv.com.

What's especially interesting is how many plans have come in the door in a short period of time. I've received six serious proposals in one recent four-week period. It's as if a secret memo went out to IT departments: "Leave your present jobs and start life anew as an IT outsourcing company."

More likely, these enterprising IT professionals are finding inspiration in the successful public offerings of outsourcing companies such as Critical Path, an e-mail hosting firm in San Francisco on whose board I serve. These corporate IT professionals look at Critical Path and figure that starting their own company sounds like a great way to earn the big bucks and stock options. They're saying, "I'm going to outsource myself before I get outsourced!"

Outsourcing in general has been a popular trend for some time, and in today's technology-driven workplaces, IT functions increasingly look like appropriate targets. But the concept of groups of key IT managers and professionals exiting to form IT outsourcing firms is something we haven't seen before. It has important implications for today's companies.

If you're the CIO, you'd better take a long look at your department, because the team may be making plans to leave tomorrow. Do you have contingency plans in place to keep your department up and running while you train a new set of IT folks? If you're an IT staff member, check out what your cube mates are doing. Are you included in their plans? Just as important, do those plans make sense? It's one thing to work as a team within the context of a larger company and quite a different proposition for that same team to be the company. Know as much as you can about your teammates' business proposition so you aren't rushed into making the wrong decision.

Of course, not every group with an idea gets off the ground. The business plans that we decide to fund take an intelligent look at what IT functions are important and necessary to offer as an outsourced business. For example, it doesn't make good business sense to fund a company whose only claim to fame is its ability to write Java code. On the other hand, IT professionals who can put together a package of IT functions that a financial services company needs could find themselves with a $10 million check from a venture capital firm and a bright future ahead.

Not every one of those entrepreneurs will make it, but enough of them will to ensure that IT managers leaving IT departments to become IT outsourcers will become an important trend. ◗

DAN GILLMOR

. . . the Valley wonders how long the boom will last

IN SILICON VALLEY, it's a great time to be selling $100-per-bottle wines, balsamic vinegars and other fancy foods, not to mention Porsches, BMWs and other expensive cars. It's an even better time to be selling a house; prices are beginning to remind people of Tokyo before Japan's economy hit the wall.

DAN GILLMOR is technology columnist at the San Jose Mercury News. Contact him at dgillmor@sjmercury.com.

Companies raid one another for employees, paying ever-better salaries and dangling ever-more stock options, and workers proudly tell of the four companies they have joined in as many years. More money than ever is flowing into technology venture capital funds. Established executives in old-line businesses are quitting to join the rawest start-ups, and young people flock to the Valley in the faint hope of creating or being part of a start-up company. Everyone hopes to become another eBay or to be bought by Microsoft or Cisco before hitting the wall and running out of cash, as so many do.

This isn't so much a bubble economy — though it certainly has that quality in many ways — as it is a momentum economy. From investors to employees, everyone is betting on the momentum and not worrying too much about hitting the inevitable wall, hoping to cash out before the wall appears out of the mist.

Why should an IT department in Detroit or Miami or Kansas City care about this? Because even though Silicon Valley remains the epicenter of this phenomenon, the unprecedented boom and creation of wealth in this place isn't happening in a vacuum. The tech boom has helped fuel the national expansion by helping companies to be more efficient.

IT has been dealing with the consequences of the economic thunder for a while now, mostly in implementing the tools that have come from companies in Silicon Valley and other high-tech hotbeds. For IT, the most visible problem has been finding and retaining qualified workers on important projects. But the money flooding into technology venture funds has led investors to look more broadly, and this could be a new headache for IT.

One of Silicon Valley's most prominent venture firms, Draper Fisher Jurvetson, has created spin-offs of itself in other cities, in effect franchising the operation. Something like that was inevitable. There are plenty of good ideas outside of Silicon Valley and plenty of smart people in places where the cost of living is more affordable. Start-ups are finding traction not only in places like Boston, Austin and Tel Aviv, but in Minneapolis, Atlanta and Kansas City. The competition won't just be for midlevel IT workers but for CEOs, chief financial officers and the like.

More and more, companies outside Silicon Valley are having to take on some of the qualities that companies here have adopted. Living in "Internet time," that relentless compression of regular time, means moving swiftly or risking failure. It means having little time to reflect on consequences. It means rethinking the business plan every few months or facing the certainty of missing profound changes.

Old-line companies everywhere look at the Internet and see a crisis building. They fear the start-ups' ability to undermine their businesses, and in many cases, those fears are well-founded.

We may well be, as venture capitalist John Doerr likes to say, just seconds past the Big Bang of the Internet Age — with the most profound changes yet to happen and the most interesting new companies yet to be formed. Even if we are, the kind of boom we've experienced the past few years simply can't be sustained; we haven't repealed the business cycle, no matter how much short-term evidence we see to the contrary.

We should all hope this bubble deflates gently, not explosively. When Silicon Valley catches its inevitable cold, the rest of the economy could come down with something considerably worse. ◗

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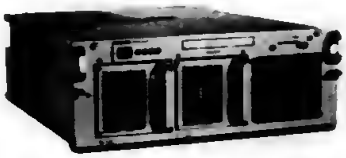

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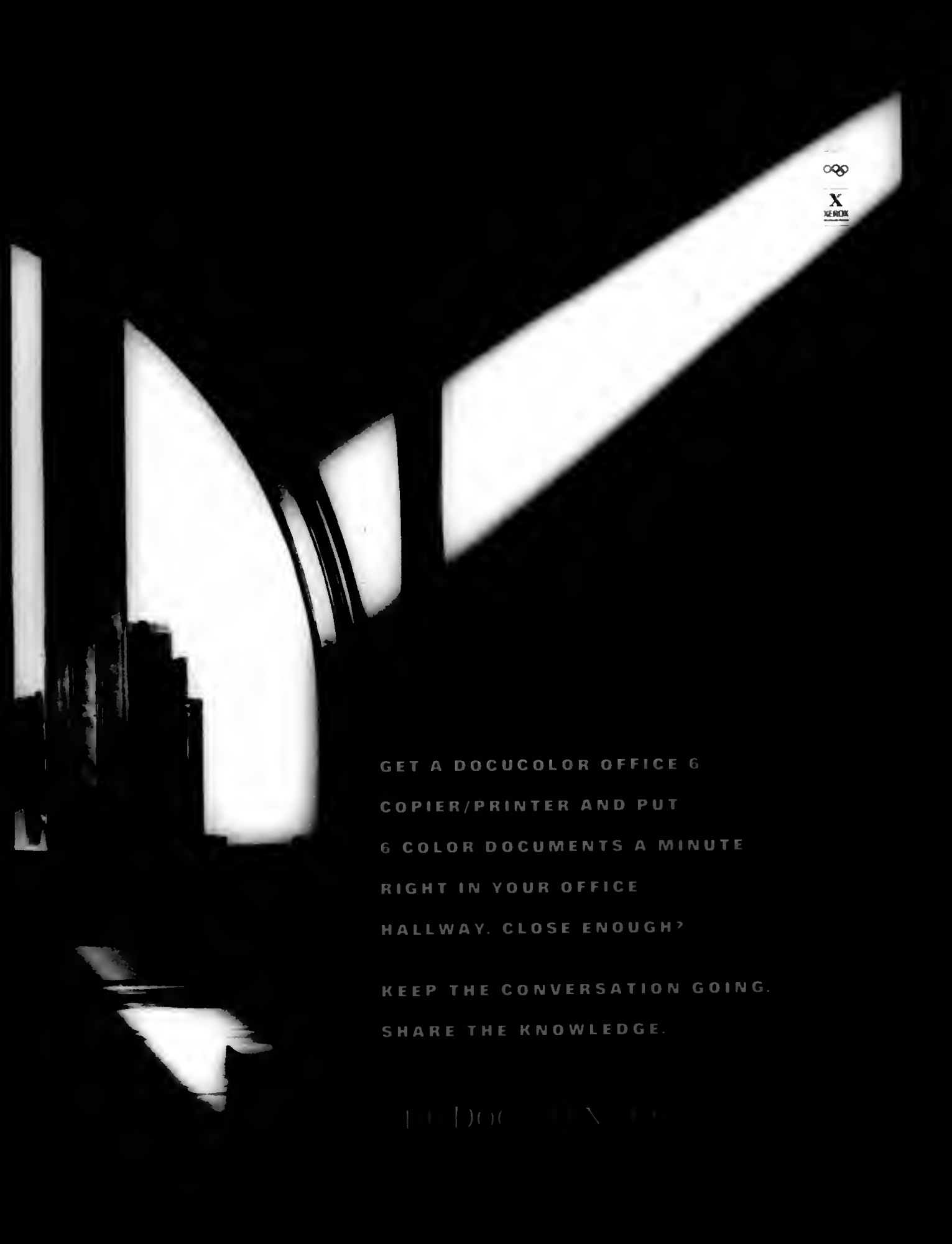

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The 100 Best Places To Work in IT

From the editor

There has probably never been a more important year for managers to care about what are the "Best Places to Work in IT" and what makes those companies special.

The supply-and-demand-gap for skilled information technology workers remains vast, with little sign of easing in the next few years. Recruiting and retention continue to be the biggest challenges facing the IT manager. And companies are scrambling to become known as "employers of choice."

There's no doubt about it — IT professionals are still a very hot commodity, and they know it. They demand higher salaries, better working conditions, more responsibility and access to training and technologies. If they don't get it, there are plenty more jobs where yours came from.

The companies that qualify as the Best Places to Work in IT know this. They recognize that the key to their success is an IT staff that's happy and loyal on the job. They provide an environment that keeps people challenged and offers a sense of contribution and value. In the following pages, you'll learn the lessons of recruiting and retention that the Best Places have to offer.

"Train to Retrain" (page 22) discusses the importance of a well-rounded training package that tackles technology, business and management skills.

Beyond training, "Rich Rewards" (page 37) examines the trends in pay and perks for a more-satisfied IT worker.

"A Guiding Hand" (page 26) looks at the growing role of mentoring programs to teach employees the business and help them develop their careers, while "All for One" (page 34) emphasizes teaming IT pros with their business peers to develop communication skills.

"Serving Up Hot Projects" (page 29) reveals the importance of keeping workers challenged with important projects and top skills.

Finally, "No Wandering Eyes" (page 44) finds that the employees at Best Places don't need to look around for top pay and training — they already have it.

Sheila Johnson

Staff (*Clockwise from top left*): **Lorraine Cosgrove, Pat Hyde, Laura Hunt, David Weldon, Mary Beth Welch, Amy Malloy and Dan Beard**

David Weldon

David Weldon
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Inside this Issue

Chart Toppers

The top five Best Places to Work companies take care of their own, offering the best in training, pay and benefits

BY LESLIE GOFF

The 100 Best Places to Work

A listing of the 100 companies with detailed information on each company and the survey methodology

training

Train to Retain

Best employers provide plenty of managerial and technical training BY SHARON WATSON

mentoring

A Guiding Hand

Nearly three-quarters of Best Places companies offer formal mentoring programs BY SHARON WATSON

Serving Up Hot Projects

Hot projects keep employees challenged, happy and up-to-date with skills BY ALICE LAPLANTE

teamwork

All for One

Best Places companies team up IT with folks from the business side to keep the lines of communication open

BY HOLLY BUBBARD PRESTON

Rich Rewards

Compensation packages are getting larger, more varied and fun BY JOANIE WEXLER

No Wandering Eyes

Employees don't need to look around for better pay or training — they've got the best already

BY ALICE LEECE KELLY

stress

Relieving the Pressure

Everything from counseling to games are called on to lighten the IT worker's load BY MARY BRANDEL

Verticals

A look at Best Places To Work in four industries:

Financial Services: Big Payoffs BY TOM DUFFY

Retail: Minding the Store BY FAWN FITTER

Technology: A Delicate Balance BY FAWN FITTER

Utilities: Lighting the Way BY STEVE ALEXANDER

The Top

1 Lincoln Electric

Think Globally, Act Locally

Maureen Bagley joined Lincoln Electric in Cleveland in 1990, right after she graduated from Purdue University. Nine years later, she's been at the company far longer than she would ever have imagined.

Originally, Bagley thought she'd get just a year or two of experience at the manufacturer of engines and welding supplies and then move back to St. Louis, her hometown. But the atmosphere induced her to stay.

"I ended up loving the company," she says.

"There is a real family here and a sense of loyalty that all Lincoln employees have," explains Bagley, a systems architect. "You feel like you want the company to do well. And when it does, we have the bonuses."

The Lincoln bonus program, The Incentive Performance System, began in 1934 and is legendary in business school case studies. Thirty-one percent of each employee's salary is based on meeting personal and company performance targets.

Also legendary is Lincoln's history of offering cutting-edge benefits. The 104-year-old company was among the first to provide group life insurance, in 1915; paid vacations, in 1923; and employee stock ownership, in 1925. More recently, Lincoln has broadened its benefits to cover spousal equivalents, and it offers elder care and subsidized child care.

The benefits, in turn, create a team spirit that extends beyond the workday. Group lunches are de rigueur, and there's a company dinner dance each winter and a family day each spring at an amusement park.

"There's a camaraderie here," says Chuck Mehlman, vice president and CIO.

Nevertheless, Bagley concedes, two years ago, when information technology demand — and salaries — began to skyrocket, she thought about looking around. Though her annual bonus was a strong incentive, the base pay was low.

Moreover, Bagley was starting to feel that IT's overall contribution was limited. "If we wanted to do something new, we would have meetings for months and months, and then nothing would happen," she says.

But then the IT environment changed. A new senior management team launched a corporate initiative to improve Lincoln's global position. With the initiative came a move to fortify the local IT ranks.

The team hired Mehlman and bought in to his plan to implement companywide standards and procedures, scrap Lincoln's legacy systems for an ambitious SAP AG installation, build a data warehouse and invest in people.

Lincoln's internal IT staff wasn't sacrificed in the transition. The permanent staff doubled in a year. Lincoln paid $33,000 per IT employee for an average 26 days each during enterprise resource planning training, and salaries were increased to match the national market.

"It's a lot different than the way it was even two years ago," says Bagley, who has received a promotion and three salary adjustments in the past two years, including one $15,000 hike. "We had to scrape by then."

Though busier now, IT professionals and line-of-business staffers, who are organized into functional "pods," find ways to make merry throughout the workweeks in spite of the intensity.

Bagley's pod, for example, plays a 10-minute game of *Jeopardy* each day and keeps a running tally of the scores.

Earlier this year, Bagley returned from four months of fully paid maternity leave. "As a new mom, all the hours were getting to me," she says. "Management came out and said, 'You are worth more on the project at 40 hours a week than zero hours, so work what you can. Don't abandon your family.' "

Five

These five Best Places to Work companies offer top-notch training, benefits, pay and skill-building opportunities BY LESLIE GOFF

2 Harrah's Odds-On Favorite

Todd Dube, an applications programmer, and his wife were ready to leave Detroit for greener pastures. They were looking for a city where they could raise a family and find steady, challenging work.

Dube had been working for Harrah's Entertainment Inc. as a consultant, and the company, which operates 18 casinos and hotels under three chains — Harrah's, Showboat and the new Rio — flew him to Memphis to interview for a full-time position at its headquarters.

The small city on the banks of the Mississippi River, home to Graceland, Sun Records and some of the South's best barbecue, fit the bill. It had good neighborhoods close to the company and other amenities, Dube says. But it was the environment at Harrah's that sealed the deal.

"There was no silver bullet — it was a combination of things," Dube says of his attraction to Harrah's. "I've talked to people who have been here 18 years, and they are really smart and could go anywhere. But they choose to stay here."

In fact, Harrah's IT organization has only a 5% turnover rate. Eileen Cassini, director of information technology services, attributes that to a "holistic approach" to recruiting and retention. The combination of a comfortable city and a comfortable company puts the odds in Harrah's favor, offering a balance in professional and personal lives that's hard to beat.

Last year, Harrah's spent $6,000 per IT staff member on training for a minimum of two weeks each. Everyone on the 400-member staff went through Visual Basic classes as well as training in Web development tools, and 90% had enterprise resource planning (ERP) training. Dube says they also had the option of taking classes in business writing, project management and other soft skills.

Jack Kaiser

"We were launching new IT projects, and IT is taking a bigger role as a partner to the business," Cassini says.

This year, the company is implementing an extensive ERP system for financials and human resources. It will work in conjunction with Harrah's data warehouse, dubbed WINet (a registered trademark), which allows users to instantly retrieve customer information online.

With so much IT activity, Dube found the challenging work he had wanted. In his group, the company is installing and customizing a Teradata decision-support database for marketing. He's working on a front end for customer service representatives, called the TeleServices Workstation Manager, which enables the representatives to retrieve information on each customer's preferences.

"They let us take risks," Dube says. For example, he saw some areas in which he could improve the speed and ease of use of the system. "As long as I can identify the benefits, I can run with whatever ideas I have."

The corporate benefits are good, too. Every Friday, the workday ends at 11:30 a.m., giving employees time for personal errands or an early start to a long weekend. Families with high school seniors can apply for corporate college scholarships. The employee referral reward is $3,000, plus an entry into a drawing for a Caribbean vacation. The company offers tuition reimbursement for both career-related and extraneous courses. And it matches employee contributions to the 401(k) plan dollar for dollar up to 6% of their annual salary.

"We work as hard on retention as we do on attraction," says Cassini, who has been at Harrah's 26 years. Last year, she took home a Chairman's Leadership Award, owing at least in part to her role in the organization's outstanding retention record.

"There's a feeling of permanence and security here . . . an esprit de corps," she says.

Dube has been at Harrah's now for two years. Nine months ago his wife joined the company as well. Memphis, it turns out, was worth the gamble. ●

Profiles, page 6

profile

3 Computer Associates
Too Much Of a Good Thing

When a Computer Associates International Inc. employee suggested recently that the company cafeteria deliver lunch to people in their cubicles, CA management rejected the idea. It wasn't because of the expense or the extra effort. CA already goes the extra mile, and then some, to make the workday more convenient for its employees.

You can buy takeout food, milk or eggs at the company's on-site deli as you leave for the day. You can work out at the company's on-site gym. You can drop off your kids at the on-site Montessori day care center. You can give blood at the office.

The idea was rejected, says Gary Quinn, because even convenience can be too much of a good thing.

"We don't want people to be isolated in their workspace all day," explains Quinn, executive vice president for global information and administrative services at the Islandia, N.Y., company. "Some people take the convenience to an extreme and don't manage the balance between their work and home lives. . . . We don't want their whole lives revolving around this building."

And yet working for CA's information technology organization is as much a lifestyle choice as a career choice. Quinn's staffers work on average nine to nine and a half hours per day. In exchange, CA goes out of its way to make employees' lives easier. Besides the day-to-day conveniences, employees get a wide range of uncommon benefits, from free breakfast and dinner to elder care insurance and financial assistance for adoptions.

Bill Taub, a network engineer and administrator who came to CA via an acquisition, has joined the fold wholeheartedly. Taub was CIO at ANT Internet, a small systems integrator and Web site development firm CA purchased in 1996. Though he often puts in 60-hour workweeks, he says he never feels chained to his desk. "I never feel that I can't leave," he says.

Taub says he feels well-rewarded by his salary, the bonus program and training opportunities, such as CA's support of his quest for Windows NT certification. The stability of working for a large, global IT organization frees him to focus on the job at hand, Taub adds, and he finds the day-to-day routine invigorating. "We have a great review process that rewards you with all you need to grow," Taub says. "We get new challenges daily, and feedback is easy to come by. In a lot of jobs, it seems as if you never do enough. Here you feel that your extra effort is appreciated."

Whereas CA spent much of the past two years rebuilding its IT infrastructure, it has now turned its focus to constructing internal applications to support its services organization and business-to-business e-commerce, Quinn says. With the infrastructure stabilized, staff growth has slowed to 15% this year from 20% last year. Nevertheless, CA faces the same IT recruiting and retention challenges as everyone else, Quinn says. Turnover rose to 10% last year from 2% to 4% in 1997. He blames the local job market.

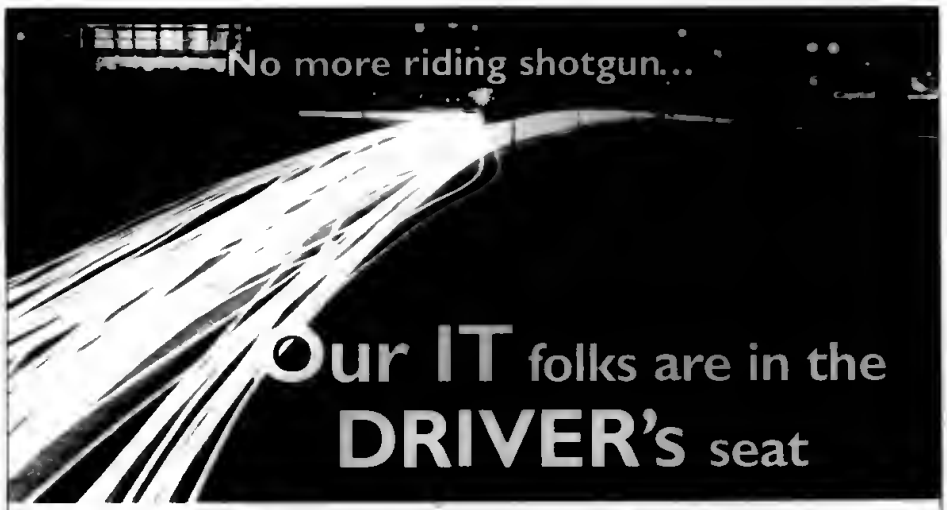
"On Long Island, it's extremely competitive," Quinn says. "Everyone has a job, so there's a churn of employed professionals. We have The Bank of New York, Cablevision [Systems Corp.], Arrow [Electronics Inc.] and a lot of small and medium companies that are now willing to pay the salaries and benefits that CA pays."

In response, Quinn initiated a project-completion bonus program for his IT staff. Between April 1998 and March 1999, about a half-dozen staff members received all-expense-paid trips for their families. Others garnered cash bonuses of 7% to 10% of their base salary for meeting deadlines with the identified deliverables.

Computer Associates' Gary Quinn initiated a project-completion bonus program, rewarding IT employees with cash and trips.

Because sometimes you can't get too much of a good thing. ▸

Profiles, page 8



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4 USAA At Your Service

At Christmastime, when parents of young children were racing frantically around San Antonio to get hard-to-find Beanie Babies Wrinkles and Unicorn, Ellen Fernandez just walked over to an on-site United Services Automobile Association (USAA) employee store, one of five on the corporate campus. It had plenty of them. No problem.

When she needed some cold medicine one afternoon, Fernandez didn't have to sneak out to drive to a drugstore. She just walked over to one of USAA's three on-site medical clinics. No problem.

"No problem" is a recurring theme at USAA, a provider of insurance and financial services to military personnel and their families. Is commuting to the office giving you a case of road rage? No problem. Just use the company's van pool service. Need one day a week to yourself? No problem. Take advantage of the company's four-day workweek, or work three 12-hour days. USAA is flexible.

In fact, USAA's corporate culture is legendary in San Antonio. The campus is a sprawling 286 acres of office space, jogging paths, softball fields and tennis courts. On the grounds, in addition to the employee stores and walk-in clinics, are three fitness centers and five company cafeterias.

"People have always wanted to come work here," says Fernandez, a San Antonio native who worked in the area as a mainframe programmer for 18 years before joining USAA last fall as an IT recruiter.

USAA's no-problem attitude toward employee comforts is grounded in a service ethic that can be traced to the company's origins. The founders were 25 Army officers who banded together in 1922 to insure themselves after they left the military.

The company's mission is to serve others who have served, and nowhere is this more evident than in IT, which encourages using technology "to service, not to sell," says retired Army Gen. Donald Walker, CIO of USAA and president and CEO of its IT arm, USAA Information Technology Co. "[USAA] believes in leveraging IT to provide better service, all the way up to the CEO, who is willing to make the infrastructure investments."

Donald Walker, CIO, says USAA views its people as "strategic assets."

The company conducts 80% of its business over the phone, Walker says, and IT develops call center innovations and data mining applications to make customer service representatives more responsive.

USAA's allegiance to its customers spills over into its relationship with its employees as well. "If we take care of our employees, they will take care of our members," Walker says.

USAA staff are offered an aggressive training program. The program includes eight days of classroom training per year, plus Twilight University, an evening program featuring speakers on IT topics; Tech Days, when USAA's vendors set up product demonstrations at the company; and the T&T Transitions to New Technology seminar series, which features leading IT thinkers.

"Our training is very interactive and engaging," Walker says. "Our strategic assets are our people and our technology, and helping the workforce absorb the technology and making sure they know how to use it is an exciting part of what we do."

The training was one of the draws for Fernandez when she first looked at USAA. "I knew they'd give me the training I needed to go on with my career," she says. Fernandez plans to get training in Visual Basic and Java.

The four-day workweek and a generous 401(k) plan that matches employee contributions dollar for dollar up to 6% of their annual salary were also magnets for Fernandez. USAA also offers corporate performance-based bonuses of between 14% and 16% of annual salary, discretionary holiday bonuses of two-weeks' pay and a paid pension plan with a built-in inflation rate.

These benefits, combined with the training, make Walker's job a lot easier: USAA's IT turnover rate is a mere 3.6%, including retirees.

"We have a service ethic that our employees can come to work every morning feeling good about," Walker says.

Profiles, page 10

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5 Avon More Than Meets the Eye

Appearances mean a lot in a cosmetics company. When Harriet Edelman accepted the position of interim CIO more than a year ago at Avon Products Inc. in New York, while she was also senior vice president of global operations, she looked at what its IT recruitment ads conveyed about the company.

"A lot of people still associate us with the 'Ding-dong, Avon calling' ads from the '50s," says Edelman, who still holds the senior vice president position. As of April, Avon's CIO has been Sateesh Lele. "We are high-touch, but behind that is a lot of high tech."

Avon processes 50 million individual customer orders and 2 million business transactions per year. "We're transaction-intense, and we require a lot of technology for the backbone," Edelman says.

So while the ads emphasized some of the company's benefits and core values — the work environment, on-site day care, diversity — they lacked high-tech oomph. "I wanted to macho them up a bit and put in information about the applications and the environment," Edelman explains.

"And our technology looks good, too." The hit ratio went up immediately. So did the company's internal employee referrals.

Edelman's fresh approach to the ads illuminates Avon's essence. Though the company is 114 years old and possesses a firmly entrenched corporate culture, it's among the most diverse, forward-thinking companies around. The company's benefits include elder care reimbursement, telecommuting, flextime and benefits for spousal equivalents, all designed to respond to employees' shifting needs. Women make up 39% of the information technology staff, and ethnic minorities account for 31%. Among the IT managers, 28% are women, and 16% are minorities.

The cubicles with windows go to staff rather than management. Nearly every week, there's a luncheon to recognize an outstanding employee.

In addition, Avon has spent an average of $23,000 each on several large events for employees in the past two years, says Debra Pinon, a database analyst.

"We've been under so much stress and pressure that Harriet wanted to build morale," says Pinon, who organized the events. "People aren't complaining, but we work a lot of hours. We want to keep everyone happy, and this helps."

In the past six years, Avon's character has manifested itself in an IT environment that's aggressively responding to the changing business. Last year, Avon rolled out a formula management system to support product development; it just completed a blueprint for a global marketing system; it's in the midst of an enterprise resource planning implementation; and it's deploying Web-enabled applications in the field that will be tied to its data marts. And it has e-commerce projects.

The IT work environment may be enlightened, but the work ethic is intense. With so many projects in the loop, IT is an around-the-clock operation that can, at times, be "punishing," Edelman says.

Staff members carry beepers, and many work on weekends. Management has to pay constant attention to the ambience and the balance between work and home.

Pinon, for example, is a single mother of a 7-year-old. Although she has the option of working flexible hours, she says she prefers "to be in the middle of the action." But when her daughter is home sick, Pinon works at home, courtesy of a laptop and an Integrated Services Digital Network line paid for by Avon.

"Management has never had a problem with that, and there are all sorts of home issues around here that all get addressed," she says.

Yet amid all the pressure and change, the commitment to Avon's nucleus remains firmly intact, Edelman says. It's the "Avon Lady," the door-to-door sales associate who made the company what it is today, who continues to define IT's mission.

"That alone sets an inherent spirit and a character to the organization that is extremely warm and giving," she says. ◆

"We are high-touch, but behind that is a lot of high tech," says Harriet Edelman, with Avon's CIO, Sateesh Lele.

Reginald Gaiger

Goff is a freelance writer in New York. Contact her at lgoff@ix.netcom.com.

PRICEWATERHOUSECOOPERS

The Top 100

The 100 Best Places to Work in IT

1	Lincoln Electric	Industrial/farm equipment Cleveland	www.lincolnelectric.com	28	21%
2	Harrah's Entertainment Inc.	Entertainment Memphis	www.harrahs.com	14	45%
3	Computer Associates International Inc.	Computer software and services Islandia, N.Y.	www.cai.com	21	39%
4	United Services Automobile Association	Insurance San Antonio	www.usaa.com	8	62%
5	Avon Products Inc.	Cosmetic/skin care products New York	www.avon.com	14	48%
6	PricewaterhouseCoopers	Professional services/consulting New York	www.pwcglobal.com	27	8%
7	Musicland Stores Corp.	Retail Minnetonka, Minn.	www.musicland.com	10	80%
8	The St. Paul Cos.	Insurance St. Paul, Minn.	www.stpaul.com	10	47%
9	Minnesota Life Insurance Co.	Insurance St. Paul, Minn.	www.minnesotamutual.com	25	50%
10	The Home Depot Inc.	Retail Atlanta	www.homedepot.com	17	40%
11	KeySpan Energy Corp.	Utilities Hicksville, N.Y.	www.keyspanenergy.com	7	85%
12	Solectron Corp.	Computers/electronics Milpitas, Calif.	www.solectron.com	15	30%
13	Capital One Financial Corp.	Financial services Falls Church, Va.	www.capitalone.com	20	11%
14	The Earthgrains Co.	Food service St. Louis	www.earthgrains.com	15	60%
15	Nortell Corp.	Professional services/consulting Atlanta	www.nortel.com	10	25%
16	Orion Capital Corp.	Insurance Farmington, Conn.	www.orioncapital.com	20	40%
17	Consolidated Stores Corp.	Retail Columbus, Ohio	www.crelcore.com	10	80%
18	Avnet Inc.	Computers/electronics distributor Phoenix	www.avnet.com	20	42%
19	Chevron Corp.	Oil/gas exploration/refining San Francisco	www.chevron.com	10	80%
20	Corning Inc.	Computers/electronics Corning, N.Y.	www.corning.com	10	75%
21	Dynegy Inc.	Utilities Houston	www.dynegy.com	10	30%
22	Regions Financial Corp.	Financial services Birmingham, Ala.	www.regionsbank.com	10	80%
23	Staples Inc.	Retail Framingham, Mass.	www.staples.com	8	40%
24	The Chase Manhattan Corp.	Financial services New York	www.chase.com	15	56%
25	Cigna Corp.	Insurance Philadelphia	www.cigna.com	8	68%
26	Fannie Mae	Financial services Washington	www.fanniemae.com	13	43%
27	Office Depot Inc.	Retail Delray Beach, Fla.	www.officedepot.com	10	30%
28	Wal-Mart Stores Inc.	Retail Bentonville, Ark.	www.wal-mart.com	25	46%
29	Household International Inc.	Financial services Prospect Heights, Ill.	www.household.com	14	60%
30	J. B. Hunt Transport Services Inc.	Transportation Lowell, Ark.	www.jbhunt.com	15	19%
31	Phillips Petroleum Co.	Oil/gas exploration/refining Bartlesville, Okla.	www.phillips66.com	10	92%
32	Sears, Roebuck and Co.	Retail Hoffman Estates, Ill.	www.sears.com	10	39%

Methodology

When we set out to find the best places to work in information technology this year, we started by defining the characteristics of a "good" place to work: interesting projects, flexibility, opportunities for advancement, diversity, benefits and an interest in the overall well-being of employees.

We surveyed CIOs, vice presidents, directors and managers at Fortune 1,000 companies and major consulting firms. Our survey asked them about their organizations' benefits, training, average salary increases, percent of staff promoted, turnover rates and the percentage of women and minority staff in management positions in IT departments. In addition, we wanted to hear about each organization's hot projects, mentoring programs and a variety of benefits ranging from elder care and child care to flextime and stock options.

We contacted 1,144 organizations in November 1998, asking them to complete the survey. The ranking is based on several of the criteria, each given equal weight and scored separately. The ranking is based on information gathered at that time.

Average [illegible] compensation	[illegible]	Bonuses percent of total compensation	Staff [illegible] team	For [illegible]	[illegible] women	IT [illegible]
26%	64%	36%	38%	Yes	29%	14%
15%	79%	21%	80%	Yes	41%	11%
15%	88%	12%	60%	Yes	28%	23%
14%	88%	12%	40%	Yes	33%	24%
15%	87%	13%	68%	Yes	31%	18%
14%	88%	12%	95%	Yes	26%	21%
10%	79%	21%	70%	Yes	50%	10%
10%	96%	4%	25%	Yes	39%	4%
11%	87%	13%	62%	Yes	53%	4%
NA	44%	56%	90%	Yes	30%	7%
10%	90%	10%	50%	Yes	20%	25%
6%	85%	15%	100%	Yes	25%	50%
12%	77%	23%	90%	Yes	3%	2%
8%	86%	14%	100%	No	50%	0%
15%	78%	22%	90%	Yes	50%	25%
15%	75%	25%	95%	No	27%	6%
10%	75%	25%	65%	Yes	20%	10%
7%	90%	10%	90%	Yes	33%	33%
4%	90%	10%	70%	Yes	21%	15%
10%	93%	7%	75%	Yes	40%	11%
6%	79%	21%	60%	No	40%	25%
5%	78%	22%	30%	Yes	57%	13%
13%	90%	10%	55%	Yes	35%	5%
7%	88%	12%	30%	Yes	27%	25%
6%	88%	12%	58%	Yes	39%	9%
8%	74%	26%	75%	Yes	43%	35%
10%	86%	14%	60%	No	27%	22%
12%	85%	15%	60%	Yes	27%	6%
7%	96%	4%	55%	Yes	36%	14%
17%	87%	13%	70%	Yes	36%	0%
14%	85%	15%	50%	Yes	14%	3%
5%	90%	10%	75%	Yes	45%	15%

Note. All results apply to IT staff only. *1998, expected at time of survey; **with business units

33	**Teco Energy Inc.**	Utilities Tampa, Fla.	www.teco.net	10	80%
34	**Cabot Corp.**	Chemicals Boston	www.cabot-corp.com	11	85%
36	**Cox Communications Inc.**	Telecommunications/media Atlanta	www.cox.com	15	80%
36	**Global Marine Inc.**	Oil/gas exploration/refining Houston	www.glm.com	10	85%
37	**InaCom Corp.**	Computer reseller Omaha	www.inacom.com	10	80%
38	**Apple Computer Inc.**	Computers/electronics Cupertino, Calif.	www.apple.com	25	90%
38	**Continental Airlines Inc.**	Transportation Houston	www.continental.com	5	95%
40	**Fingerhut Cos.**	Retail Minnetonka, Minn.	www.fingerhut.com	10	60%
41	**John Hancock Mutual Life Insurance Co.**	Insurance Boston	www.jhancock.com	8	71%
42	**Lucent Technologies Inc.**	Telecom equipment and software Murray Hill, N.J.	www.lucent.com	10	71%
43	**Allstate Insurance Co.**	Insurance Northbrook, Ill.	www.allstate.com	10	63%
44	**MONY Group Inc.**	Insurance New York	www.mony.com	8	53%
46	**Sonoco Products Co.**	Forest and paper products Hartsville, S.C.	www.sonoco.com	18	62%
46	**Best Buy Co.**	Retail Eden Prairie, Minn.	www.bestbuy.com	15	17%
47	**Crown Central Petroleum Corp.**	Oil/gas exploration/refining Baltimore	www.crownfleet.com	10	80%
48	**Federated Mutual Insurance Co.**	Insurance Owatonna, Minn.	www.federatedinsurance.com	11	80%
48	**Modis Professional Services Inc.**	Professional services/consulting Jacksonville, Fla.	www.modispro.com	12	10%

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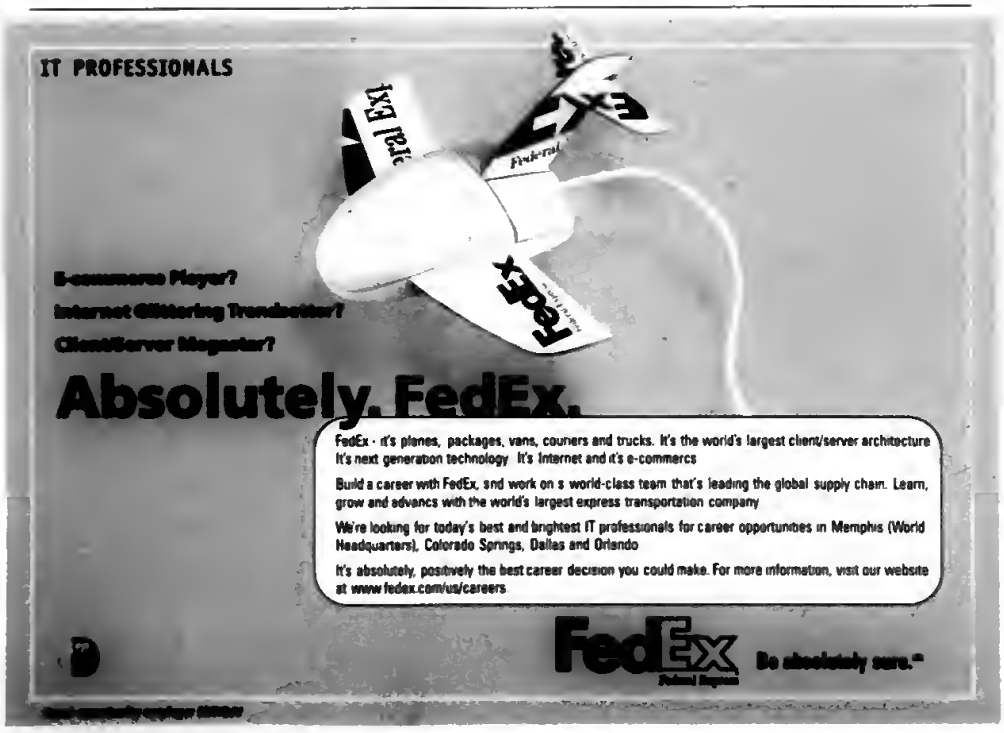
6%	87%	13%	100%	Yes	50%	25%
10%	86%	14%	70%	Yes	15%	15%
8%	88%	12%	55%	No	30%	2%
6%	73%	27%	90%	Yes	25%	40%
8%	87%	13%	40%	Yes	45%	10%
5%	88%	12%	25%	No	10%	10%
15%	80%	20%	50%	Yes	90%	10%
9%	96%	4%	80%	No	50%	5%
8%	82%	18%	50%	Yes	35%	7%
5%***	87%	13%	75%	Yes	39%	20%
NA	NA	NA	50%	No	30%	16%
8%	93%	7%	65%	Yes	56%	11%
7%	90%	10%	65%	No	22%	17%
20%	94%	6%	65%	Yes	31%	8%
10%	75%	25%	50%	No	10%	2%
12%	96%	4%	40%	No	45%	45%
13%	89%	11%	90%	Yes	40%	20%

Note: All results apply to IT staff only. *1998, expected at time of survey; **with business units; ***not including bonus

If you think we treat our customers well, wait until you see how we treat our employees.

BEST PLACES

50	Trinity Industries Inc.	Manufacturing/transportation Dallas	www.trin.net	20	15%
51	Navistar International Corp.	Truck manufacturer Chicago	www.navistar.com	10	70%
52	Amgen Inc.	Pharmaceuticals Thousand Oaks, Calif.	www.ext.amgen.com	10	45%
53	Sigma-Aldrich Corp.	Chemicals St. Louis	www.sigma-aldrich.com	14	70%
54	UnitedHealth Group	Health care Minnetonka, Minn.	www.unitedhealthgroup.com	8	20%
55	Wisconsin Energy Corp.	Utilities Milwaukee	www.wisenergy.com	7	64%
56	Honeywell Inc.	Electronics/electrical equipment Minneapolis	www.honeywell.com	5	75%
57	Parker Hannifin Corp.	Electronics/industrial equipment Cleveland	www.parker.com	15	60%
58	Airgas Inc.	Chemicals Radnor, Pa.	www.airgas.com	15	35%
59	Costco Cos.	Retail Issaquah, Wash.	www.costco.com	21	70%
60	Masco Corp.	Retail Taylor, Mich.	www.masco.com	15	65%
61	The Limited Inc.	Retail Columbus, Ohio	www.limited.com	10	60%
62	Metropolitan Life Insurance Co.	Insurance New York	www.metlife.com	12	57%
63	Public Service Company of New Mexico	Utilities Albuquerque, N.M.	www.pnm.com	14	50%
64	Unisys Corp.	Computers/services Blue Bell, Pa.	www.unisys.com	12	80%
65	Xerox Corp.	Computers/office equipment Stamford, Conn.	www.xerox.com	10	75%
66	Becton, Dickinson and Co.	Health care Franklin, N.J.	www.bd.com	10	60%



The 100 Best Places to Work in IT

7%	82%	18%	30%	Yes	30%	10%
4%	75%	25%	30%	Yes	7%	5%
18%	88%	12%	75%	No	30%	18%
6%	100%	0%	80%	No	40%	20%
10%	71%	29%	80%	Yes	39%	7%
15%	92%	8%	57%	No	31%	6%
7%	88%	12%	50%	Yes	30%	10%
18%	88%	12%	50%	No	25%	10%
8%	80%	20%	100%	Yes	46%	6%
11%	92%	8%	75%	Yes	34%	0%
12%	88%	12%	80%	Yes	0%	0%
20%	73%	27%	100%	Yes	31%	12%
9%	88%	12%	60%	No	29%	10%
9%	81%	19%	20%	No	50%	20%
6%	100%	0%	80%	Yes	20%	10%
5%	87%	33%	100%	Yes	37%	13%
5%	88%	12%	35%	No	15%	25%

Note: All results apply to IT staff only. *1998, expected at time of survey; **with business units

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73	**American Management Systems Inc.**	Professional services/consulting Fairfax, Va.	www.amsinc.com	8	22%
74	**CDW Computer Centers Inc.**	Retail Vernon Hills, Ill.	www.cdw.com	10	13%
75	**Comerica Inc.**	Financial services Detroit	www.comerica.com	5	66%
76	**Harley-Davidson Inc.**	Motor vehicles and parts Milwaukee	www.harley-davidson.com	10	22%
77	**PG&E Corp.**	Utilities San Francisco	www.pgecorp.com	10	80%
78	**AFLAC Inc.**	Insurance Columbus, Ga.	www.aflac.com	5	21%
79	**Caterpillar Inc.**	Industrial/farm equipment Peoria, Ill.	www.caterpillar.com	10	74%
80	**The Charles Schwab Corp.**	Financial services San Francisco	www.schwab.com	10	25%
81	**Edison International**	Utilities Rosemead, Calif.	www.edison.com	10	63%
82	**Fifth Third Bancorp.**	Financial services Cincinnati	www.53.com	60	67%
83	**Frontier Corp.**	Telecommunications [illegible], N.Y.	www.frontiercorp.com	10	31%

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5%	72%	28%	70%	Yes	70%	10%
10%	80%	11%	100%	Yes	35%	80%
4%	84%	16%	15%	No	14%	0%
15%	92%	8%	40%	Yes	1%	1%
7%	97%	3%	48%	No	27%	29%
9%	88%	12%	60%	No	40%	6%
10%	91%	9%	100%	Yes	37%	8%
10%	89%	11%	80%	Yes	20%	0%
8%	84%	16%	25%	No	38%	10%
9%	92%	6%	25%	Yes	28%	7%
8%	75%	25%	60%	Yes	10%	18%
16%	91%	9%	80%	No	27%	12%
5%	86%	14%	70%	Yes	20%	5%
8%	67%	13%	60%	Yes	36%	19%
4%	86%	14%	10%	Yes	31%	34%
23%	71%	29%	50%	Yes	16%	5%
12%	90%	10%	40%	No	34%	10%

Note: All results apply to IT staff only. *1998, expected at time of survey; **with business units

- **Senior Programmer Analyst/ Application Development** - 5+ years' experience. MVS, COBOL, JCL, DB2, IMS, CICS
- **Project Manager/ Merchandising Systems Application Development** - 5+ years' experience. MVS, COBOL
- **Project Leader/ Merchandising Systems Application Development** - 3-5 years' experience. MVS, COBOL, JCL, DB2, IMS
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	10%	92%	8%	25%	Yes	30%	8%
	10%	88%	12%	85%	No	21%	10%
	4%	94%	6%	60%	No	34%	12%
	12%	93%	7%	60%	Yes	32%	14%
	6%	86%	14%	65%	Yes	40%	20%
	11%	89%	11%	50%	Yes	47%	50%
	4%	97%	3%	10%	No	20%	15%
	7%	85%	14%	20%	Yes	46%	3%
	7%	94%	6%	40%	Yes	25%	6%
	14%	93%	7%	50%	Yes	8%	3%
	6%	87%	13%	50%	Yes	16%	12%
	10%	86%	14%	25%	No	50%	0%
	10%	86%	14%	60%	Yes	20%	10%
	18%	71%	29%	25%	Yes	50%	25%
	6%	85%	15%	60%	No	25%	6%
	9%	93%	7%	60%	Yes	45%	7%
	10%	80%	20%	150%	Yes	50%	0%

Note: All results apply to IT staff only. *1998, expected at time of survey; **with business units

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Train to Retain

The Top 100 Employers know employees won't stick around without the best in training, so they offer plenty of managerial and technical training, hoping employees will stay put BY SHANON WATSON

During his two years of employment at Lucent Technologies Inc., Carl Mahecha has received nearly nonstop training. He's been tutored in SAP and accepted into an exclusive information technology leadership training course developed by the Murray Hill, N.J., telecommunications equipment maker and Babson College in Wellesley, Mass. Mahecha is also being reimbursed by Lucent as he completes an MBA program. Oh, and he's being mentored and is himself a mentor.

"Those opportunities tell me that there's a future for me at Lucent beyond today, and they're willing to invest in that," says Mahecha, who's an internal SAP consultant at the company. "My motivation level is higher; I feel more confident and secure knowing that I'm investing in myself, doing research and development for my career. And Lucent gets a person with more skills, who's very driven, who can be more valuable to the company."

Mahecha's personal and professional experiences at Lucent are typical of those of IT staff at Best Places to Work. The average IT employee at a Best Place received an expected 14 days of training last year, at an average cost of more than $7,300. With the demand for IT skills growing without a visible end and a continuing shortage of experienced talent, Best Places companies are using training to address two needs.

First, they use training to keep their IT staff on top of the latest technology so they can deliver the technology-driven solutions today's businesses demand. "The way things change, we don't have an option. Training isn't discretionary; it's a necessity," says Dick Hudson, CIO at Global Marine Inc., an offshore drilling contractor in Houston.

At the same time, Best Places CIOs freely acknowledge that training has become a vital retention tool, keeping IT talent challenged, satisfied and away from headhunters and recruiters. "If people believe they're getting a tremendous value in training, they stay longer because they know they will have value if they choose to leave," says Herb Vinnicombe, vice president and CIO at Lucent.

Strategic Skills

IT training at Best Places generally falls into two categories: training in specific technical skills and applications and training in executive-level IT management. Which staff members get what training is often decided by the staff member and a mentor or supervisor (see story, page 26) after reviewing career goals, talents and existing skills.

Business training often ranges from professional writing courses and presentation skills to strategic management skills. Technical training subjects run the gamut from Java, C++, Visual Basic, Sybase, Oracle and SAP to the Internet, e-commerce and telecommunications data networking.

"We don't do training just to train," says Steve Bromet, CIO at Consolidated Stores Corp. The retailer uses training to meet its staffing needs as an AS/400 shop located in Columbus, Ohio, where competition for IT talent is especially intense, Bromet says.

Employees received an average of 14 days of training last year.

Three years ago, the company created a training program for recruits from inside and outside the company. Many of the trainees don't have technical experience but want to break into IT. After an interviewing process, they go through three to seven months of training on Consolidated's business applications as well as RPG, Command Language and other AS/400 technical skills.

One reason the program is successful is that it lets trainees work on real-life business applications, says Roderick Booker, a senior programmer/analyst at Consolidated who graduated from the program. "We were encouraged to talk to users," he says. "If you understand what they're doing, you understand the problem better, and it's easier to learn."

Some Best Places CIOs also encourage staff to explore how leading-edge technologies may apply to their companies, which helps their career development. For example, IT staff at Office Depot Inc. routinely go to retail distribution and point-of-sale conferences, while the company's chief information systems architect goes to as many as 10 seminars each year to stay current on the latest concepts, says Bill Seltzer, executive vice president and CIO at the Delray Beach, Fla.-based company.

"Training is more than learning a technology, it's also about business applications and [research and development] for the future," Booker says.

The need to understand user requirements as well as strategic business issues is shaping the second prevalent form of training at Best Places: putting leading-edge technology in real-time business contexts. "When everyone knows what they're working on is mission-critical, that's an unbelievably effective way to keep people," Seltzer says.

To help accomplish that, the companies routinely include IT management courses in their training curriculum. Some send IT personnel to leading courses run by various business schools.

In addition to bringing management consultants to his IT training center to lead various business management seminars for IT staff, Hudson at Global Marine enrolls his key managers in the weeklong Managing the Information Resource program at the Anderson Graduate School at the University of California at Los Angeles.

Office Depot has an in-house

Continued on page 24

training

Continued from page 23

university in which IT staff receive four courses in management training. Boston-based Cabot Corp.'s "Cabot College" is built on the principles of Harvard University's Advanced Management Program courses.

Lucent has created its own management training course for its companywide IT services organization. It draws on materials created by the company's finance department and works in partnership with business experts at Babson College, which *U.S. News & World Report* recently ranked as having the top entrepreneurial business school in the country.

Only about 25 of Lucent's 5,000 IT staffers will be chosen for the Leadership Development Program, Vinnicombe says.

In general, the advanced management courses offered by Best Places are exclusive, with entrants needing to have demonstrated an interest in and aptitude for IT management.

However, the Best Places also offer tuition reimbursement programs to most or all employees.

Lucent's two-year program was designed to create graduates capable of being "transforming agents" who can help Lucent use IT to meet its business objectives, Vinnicombe says. Participants receive technical training in return for credits applicable toward an MBA.

The average cost of training per employee last year was $7,300.

Most training still takes place in a classroom setting. The verdict is still out on intranets as training tools.

Most Best Places use intranets to help staff collaborate on projects and to share knowledge bases but haven't done much training via intranets. CIOs say they simply prefer old-fashioned classroom-style training, whether conducted by internal trainers or outside consultants. "I like my people to interact with someone who is learned," Hudson says. "Good instructors can see who might require more help and attention."

In addition, classroom settings tend to keep participants focused on the training, whereas a self-directed course might get short shrift if it had to be squeezed into the workday. "It's better to do the training intensively," says Craig Bickel, CIO at Cabot.

CIOs and IT staff also say the classroom format offers an invaluable chance to get to know colleagues, particularly in large, international

organizations. "Folks need to meet and interact," Bickel says.

Mahecha says he's forming networking ties in Lucent's Leadership Development Program that will last throughout his career.

"I'm in a setting with people who are highly regarded in the company," he says.

The leadership program also helps the participants overcome the "silo mentality" that inhibits knowledge sharing at many companies, Mahecha says. "That will keep reaping rewards for us and for Lucent as we move on," he says.

Training tends to be continual at Best Places. Though classroom training may take up anywhere from a week to three weeks per year, IT staffers are generally expected to maintain a basic knowledge base by following specialty, trade and business publications.

Seltzer at Office Depot also sends staff to industry trade shows and seminars to learn about the latest products and developments in fast-moving technologies such as e-commerce and data networking. "Vendors are often the best sources of education and knowledge," he says.

The Real Deal

These Best Places CIOs also say they always try to help IT staff who ask for specific training, even if the technology in question isn't used by the company, preferring to reward rather than thwart such initiative.

"I can't remember ever saying a flat 'no,' " says Bromet, noting that Consolidated would likely pay a portion of the training costs in such instances.

IT staffers at Best Places agree that their employers back up their spoken commitment to training. "A lot of places have training policies on paper that look good when they're recruiting you, but aren't executable," Mahecha says.

Lucent, he notes, supports training by permitting employees to work flexible hours, providing them with information about reimbursable courses at various business schools, enabling them to register for those courses via Lucent's intranet and even directly reimbursing business schools.

Such attention to training details benefits the employer in the end, staffers say. "When you're well-trained, your confidence is higher, your abilities are greater and your productivity goes up," Booker says.

"Companies shouldn't underestimate the power of letting employees take advantage of opportunities to learn," Mahecha says.

Watson is a freelance writer in Chicago. Contact her at sjwatson@interaccess.com.

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mentoring

A Guiding Hand

Nearly three-quarters of Best Places companies offer formal mentoring programs

BY SHARON WATSON

Kevin Kepp didn't expect to turn an entry-level job in the computer operations center at Consolidated Stores Corp. into a 15-year-plus career at the retailer. Today, he's project director of merchandising systems for the growing Columbus, Ohio-based company.

Though he's received various bouts of technical training through the years, Kepp credits much of his upward trek to mentoring from his original supervisor, Chuck Pifer.

"Chuck is an inspirational individual and an excellent motivator," Kepp says. "He builds your confidence and helps you to know you're capable of doing whatever you want to do."

Pifer, Consolidated's information systems operations director, not only encouraged Kepp, but also gave him the opportunities and tools to make the most of his talent, Kepp says. That included allowing Kepp to explore new technologies, work on pilot projects and generally have the freedom to take chances.

"Without those opportunities to learn, it would've been difficult to acquire the skill sets I did through training," Kepp says.

If training is the direct route to formal technical and management skills, mentoring is a hand-drawn map showing the byways and shortcuts to using those skills effectively at a company.

"Mentors show people where the rocks and land mines are and how to step on the rocks to avoid the land mines," says Craig Bickel, CIO at Cabot Corp. in Boston.

Although 71% of companies that made our Best Places to Work list categorize their mentoring programs as "formal," mentoring is a highly individualized process.

Dick Hudson, right, mentored Gregg Farris while both worked at Grand Marine

James McQuon

"There aren't written rules to go by," says Bill Seltzer, CIO at Office Depot Inc. in Delray Beach, Fla. Directors of different information technology divisions at Office Depot match less-seasoned employees with company veterans. "It's more a fit of personalities and technical skills," Seltzer says.

At Office Depot, he says, directors generally match up mentoring partners; a person might stay with a mentor for quite a while or move from one to another to learn about applying different technologies.

Other Best Places companies also have relatively informal mentoring matching processes, and CIOs note that no one is forced to stay in a mentoring relationship if the personalities and skills of the two parties clash.

CIOs and mentored people agree that the best mentors are those who are secure in their own abilities, so they aren't threatened by the abilities of the person they're mentoring. Yet they're open to learning from their "students," too. Good mentoring candidates aren't afraid to ask questions or to take on responsibility.

All agree that the worst mentors are those who impose their ideas and techniques instead of sharing them.

Information and education gained via mentoring depends on the needs of the mentored person and the style of the mentor. Sometimes, mentoring involves a staff member literally following a mentor to meetings with management and vendors and learning about the idiosyncrasies of the players in a given situation.

Mentoring can also involve plotting a career path for the mentored person, both at a company and beyond it.

For CIO Dick Hudson, that career path is often outside the company. He likes to mentor his most promising people right out of their jobs at Global Marine Inc., a Houston-based offshore drilling contractor.

That's what he did with Gregg Farris. After seven years of being mentored by Hudson, he's now vice president of IT at Oceaneering International Inc., a Houston-based company that specializes in robotics maintenance in hazardous environments.

"Dick constantly encouraged me to take advantage of career opportunities and gave me every chance to exercise the skills I brought to Global," says Farris, who was mentored by Hudson from the start of his employment at the company. "He's the best boss I've ever had."

Hudson says his choices about whom to mentor are largely intuitive. In a successful mentoring pairing, the mentor and mentored tend to share common values about life and work and even management styles, he adds.

Also, Hudson says some people aren't ready for his mentoring, which involves taking on risks and responsibilities. "It's part of my job to know that," he says.

Four of the direct reports Hudson mentored are now CIOs, exactly as Hudson hoped they would be. His graduation speech: "You're ready, so let's find you a job as CIO somewhere," he says.

To prepare him to be a CIO, Farris says Hudson shifted many of his responsibilities to Farris. "He'd say, 'If you're going to be a CIO, you need to do this' — even if it was something Dick never allowed anyone else to do," Farris says.

Hudson also let Farris lead presentations and speak for the IT department in front of senior management, telling him later if and when he put his foot in his mouth and how to get it back out again.

"A lot of executives would see that as political suicide, but not Dick," Farris says.

Hudson says the results of his mentoring philosophy speak loudly to up-and-coming employees, showing them that Global Marine values them enough to train and mentor them even though they're unlikely to stay at the company forever.

For Hudson, his reward is the success of his mentoring graduates. "That's the thing I'm most proud of in my career," he says. •

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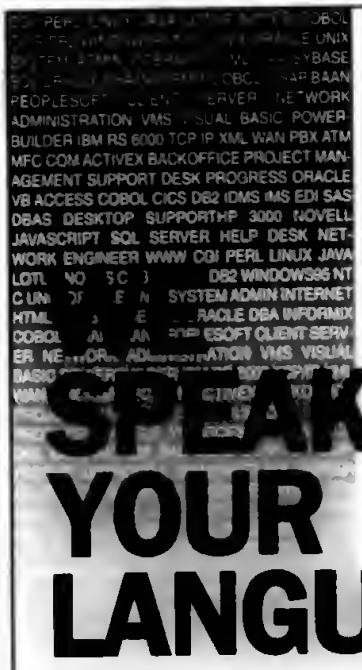

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Serving Up Hot Projects

Employees want projects that use many skills and offer challenging work

BY ALICE LaPLANTE

Sure, money talks. But in today's hopping IT job market, nothing becomes a company more than figuring out a way to keep IT employees intellectually challenged and able to grow professionally.

So, it's no surprise that the companies heading up *Computerworld*'s Best Places to Work list are the ones most likely to have a spectrum of hot projects. Those include ptojects that call for working with emerging technologies for strategic year 2000, e-commerce, enterprise resource planning (ERP), data warehousing and intranet initiatives.

According to *Computerworld*'s Best Places survey, a whopping 71% of companies say their year 2000 projects are "critical," followed by e-commerce (44%), ERP (33%), data warehousing (27%) and intranets (14%).

Gone are the days when IT took a backseat at the executive board meeting. Most companies, such as Allstate Insurance Co. in Northbrook, Ill., say IT projects these days are top on the corporate agenda. Such projects are "directly tied to strategic business needs, as they increasingly allow multiple thousands of people to touch more accurate information more quickly," says Frank Pollard, CIO at Allstate.

Also not surprisingly, Best Places companies have managed to work out ways to ensure that valued employees get the opportunities they need to work on critical projects. Increasingly, that involves formal retention programs that focus on job rotation; professional mentoring; career counseling; a cross-functional team working environment; scads of training; and, of course, wide-open opportunities for new job assignments.

Take Kim Schultze. After five years at Allstate, she left her job in AS/400 support in 1994 to "check out some other opportunities." A year later, she was back, thanks to former colleagues who offered her the chance to work on a strategic redesign of Allstate's legacy system for its property and casualty business division. "It was a wonderful chance to broaden my skill base," Schultze says. From there, she saw a job posting on Allstate's employment bulletin board for a position on the Y2K testing team. "I applied for it, and I got it," she says.

Continued on page 30

hot projects

Continued from page 29

Schultze is now part of the effort to test all Allstate systems for Y2K compliance. "It's very exciting. We cover all businesses and all technology units," she says.

What's next? Schultze isn't sure. But she's sure it will be challenging. Moreover, she points out that at a company like Allstate, which actively rotates and promotes employees from within, Y2K represented an opportunity, not a dead end. "We've learned so much and put so many processes in place that we will be able to apply to other projects," she says.

For Best Places companies, providing this kind of upward career mobility is paramount. In fact, when recruiting potential IT workers, "the first question candidates have is: What will I be working on?" says Joe Krafinski, a senior technical recruiter at Datacom Technology Group, an IT recruiting firm in New York.

Not only must the project in question involve leading-edge technologies, but "candidates are also asking about the long-term direction of an employer's IT strategy," Krafinski says. In short, for a company to be an attractive place to work, "the technology deployed must be in step — or ahead of — the market," he says.

One reason Allstate has such an impressive retention rate (63% of employees have been there five years or more) is related to the fact that business units set the IT priorities and control the IT budgets. Because of that, IT workers know they will be working on projects of "utmost strategic importance," Pollard says.

Currently, many hot projects involve Internet, data warehousing and object technologies. For example, Allstate is rolling out a new desktop to all 7,000 field workers. Based on Windows NT, the networking capabilities of the new architecture "will allow everyone to communicate more effectively with customers," Pollard says.

The Web Is Hot

Not surprisingly, working with e-commerce initiatives — anything involving the Web, the Internet, intranets or related technologies — is seen as highly prestigious. Helen Shrader just finished leading her team at Marshall Industries in El Monte, Calif., on a strategic initiative to move electronic data interchange (EDI) functions onto the Web. "This was my first Internet project, and it was very exciting," says Shrader, EDI project manager for the electronics distribution company's Microlink project. Microlink, which was just rolled out, provides Web-based just-in-time responses to queries from Marshall's Asian and European distributors.

During her nine years on the job, Shrader has been given many strategic opportunities, each of which has advanced her skill base and job status. Her first assignment was to create an EDI strategy at the corporate level; this "next step" of moving to the Web "was a wonderful project for everyone in the group because we learned so much about the technology," she says.

Although most projects deemed "hot" at Best Places companies tend to involve the networked desktop, the Internet or e-commerce, other projects of strategic importance can carry elevated stature. For example, at professional services and staffing company Norrell Corp. in Atlanta, one project deemed very hot is BOSS (Brand' Operation Support System) II. It involves "reinventing" the technology infrastructure that supports all field business processes.

Still, being a member of the Y2K team is seen as just as prestigious. The reason: Norrell handled the Y2K "problem" as an ongoing challenge for producing the highest quality systems possible and for establishing best practices for developing applications, says Ted Jurkuta, senior vice president and CIO at Norrell.

Thus Norrell built a software testing lab "that is now considered one of the best in our region," says Jean Grenir, vice president of IT. The automated testing environment in this lab is meant to be useful long after Y2K work is done. Rather than seeing the Y2K project as a professional dead end, IT staffers at Norrell — like their counterparts at Allstate

Continued on page 32

Projects considered most critical

Top Critical Project	% of Best Places
Y2K	71%
E-Commerce	44%
ERP	33%
Data Warehousing	27%
Intranets	14%

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Continued from page 30

— have clamored to be on the team. "It's obvious that on the other side of Y2K there are very exciting e-commerce and data mart projects that will exploit what we've learned building the lab," Grenir says.

For example, the BOSS II project, which incorporates a complex web of Internet- and intranet-based applications with legacy systems, also solves another problem. The original BOSS wasn't Y2K-compliant, so Norrell seized the opportunity to not only fix the Y2K bug, but also incorporate exciting new technologies into the system. IT workers involved in BOSS II are therefore on the cutting edge of Unix, Windows, WAN and Web technologies, Grenir says.

McDonald's Corp. in Oak Brook, Ill., also proves it doesn't take the Web to serve up a hot project. At the fast-food giant, IT projects are driven by business urgency. As a result, the challenges are often much more than technical. McDonald's has embarked on a highly publicized "Made for You" campaign in which customer meals aren't assembled until ordered.

Although largely a business process change, all point-of-sale systems, kitchen systems and inventory management systems needed to be upgraded and integrated, and the members of that particular IT team "are doing something that is very prominently visible to the world," says Dave Weick, vice president of IS.

Management Move

Being visible in the company is something Enolia Foti found out about when she joined Corning Inc. in Corning, N.Y., nine years ago as a senior systems analyst for the data network team. Coming from a networking background, her work involved systems analysis and design.

"Then," she says, "I had to make a key career decision: whether to continue in a technical track or move into management."

After deciding she wanted to go into management, Foti in successive years was rotated to roles within different Corning organizations: from project leader within Corning's Material Technology Business to a manager within Corning's corporate global architecture planning team to her current position as IT department head of the Erwin Manufacturing Plant in Corning's Environmental Products Division. Foti marvels at the opportunities she's had.

"I've been provided with training, with career planning and with the chance to explore various options," Foti says.

Because of the speed at which IT must move to support business initia-

tives, more important than specific technical skills is attitude when deciding who gets to work on a hot project. And not surprisingly, competition to work on a hot project is often fierce. That's the case at Marshall Industries' newly launched Education News and Entertainment Network, which provides real-time technical training, product announcements and marketing presentations through Internet broadcasting to employees and associates around the globe.

Though SAP, Oracle and e-commerce experience is needed to get one of the sought-after spots on this and other projects, Leo Yu, Marshall's director of infrastructure, also looks for the tight mix of personalities that will make a team productive.

At McDonald's, "communication and attitude" are key to joining a hot project, Weick says. "We're always looking for basic technological and problem-solving skills. But we want the right attitude. And that attitude is: 'We will get this job done.' "

The stress level can be very high on important projects, but because of the professional development benefits, IT employees are usually eager to jump on board.

Just Desserts

And the rewards can be substantial, too. Foti was given the opportunity to design the IT infrastructure for a factory being constructed in Charleston, S.C. That meant commuting from upstate New York for 11 months and an exhausting and stressful schedule, "but I felt very lucky to be given the opportunity," she says.

And there can be some fun involved. Some CIOs believe that the IT department that plays together has a better chance of staying together. Which is why Norrell's Jurkuta goes bowling every Wednesday afternoon, and there's an open invitation for any IT worker to come along. And why Weick rewarded the Y2K team at McDonald's with a three-day weekend at a spa that included golf, massages, sauna — the works.

"It's important to create an environment so that when people wake up in the morning, they actually want to come to work," Jurkuta says.

Just ask Mirch Calandar. At a time when even a two-year employment tenure makes you an IT old-timer, Calandar's 22 years at Allstate verges on legendary. Now a senior planning consultant at the firm, Calandar still looks forward to coming into work every day. "I've never thought, 'Oh, no, I have to get up and go to work.' " And the primary reason for that, Calandar says, is the constant technological challenge. ■

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All for One

The best way to give IT employees a sense of involvement and contribution is to team them up with folks from other departments

BY HOLLY HUBBARD PRESTON

Steven Bandrowczak has a big issue with information technology staffers who don't know how to mingle beyond their own department. That kind of "us and them" mentality is not only antisocial, but also self-defeating, says Bandrowczak, Avnet Inc.'s CIO.

To counter that attitude, Bandrowczak will send Avnet programmers and marketing executives out on trail rides together. He sometimes teams network administrators with sales managers for a night of bowling. And once a month, he hosts "Breakfast with Steve," where he briefs IT staffers on important non-IT business issues at the Phoenix-based company.

When it comes to making sure his staff is clear on company direction, Bandrowczak leaves nothing to chance.

Anything "to try and get a sense of commonality" between the electronic distribution and material management company's many separate business divisions, Bandrowczak says. The payoff: better communication, productivity and morale for his staff and the rest of the company.

The "us and them" mentality Bandrowczak is challenging at Avnet is hardly an anomaly in corporate America. IT professionals and their managers often find themselves relegated to their own, somewhat isolated corner of the corporation, waiting to be called on when in-house technology goes wrong or upgrades are required. The result: IT staffers are often dissatisfied with their jobs.

That's exactly what Questar, a full-service research and consulting company, found. The Eagan, Minn.-based research firm specializes in employee and organizational behavior and recently analyzed how its own employees from different departments communicate with one another.

"When Questar employees [from outside IT] talk to our IT support staff, which is on a pretty regular basis, it is usually with a sense of urgency because something has gone wrong," says Jennifer Mattocks, a Questar consultant. These exchanges, Mattocks has found, tend to be "more negative" and less empathetic than interactions between employees in other departments.

Most Best Places' IT staffers work in cross-functional teams with business staff.

That isn't the case at Avnet, AirGas Inc. or Solectron Corp., all deemed Best Places to Work. In fact, the one thing all three companies have in common is they actively push cross-divisional team-building.

Cross-divisional teams, as defined by those companies' CIOs, could involve activities ranging from exercises designed to mix staff and managers from different divisions to the formation of teams of employees from different units who work together on IT deployments. These CIOs see team-building as a way to eliminate communication gaps.

On average, 61% of employees at the companies on this year's Best Places list work in cross-functional teams with business staff.

How do the employees feel about it? For them, team-building can result in greater job satisfaction, a more exciting career path and a greater sense of purpose.

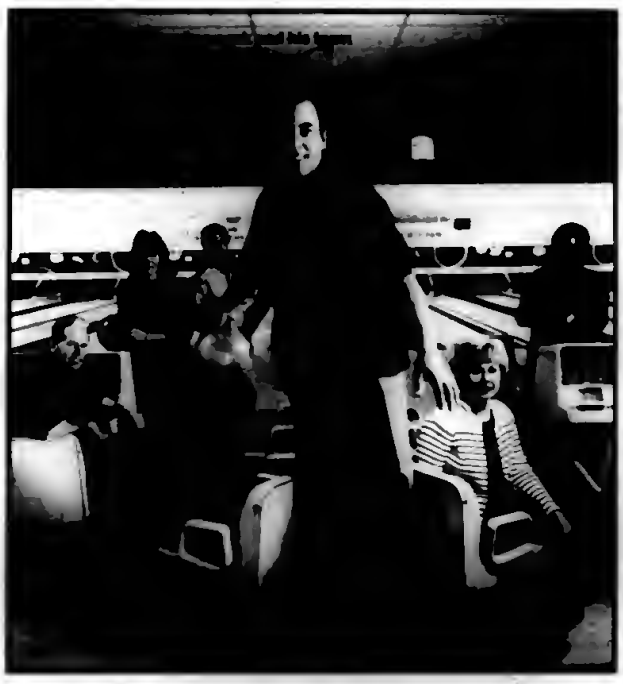
"If team-building can help me get to know the people I'm supposed to serve better, that is better for me. It increases my value within the organization and puts me on a better, more diverse career path," says Casey Zandbergen, a senior information systems manager at AirGas.

When Zandbergen first came to the Radnor, Pa., industrial and medical gas distributor, he knew little about the company's non-IT-related business. Not anymore.

Through the cross-divisional field project management approach estab-

lished by AirGas CIO Sandy Goldstein two and a half years ago, Zandbergen says he's received a crash course in Business 101.

Under Goldstein's tutelage, AirGas instituted an "externship" program where IT staffers and managers are assigned to work in divisions outside of their own for several weeks a year. To further facilitate communication, AirGas has invested in a videoconferencing network based on Microsoft NetMeeting, which enables IT and non-IT project associates to communicate with one another from their home or field sales offices.



David Zicki

"I've seen a lot of my friends working in other IT departments become pigeonholed, working on the same types of projects with the same people," Zandbergen says. "Not me. I have a lot of understanding of business processes, not just IT business processes."

It's exactly that kind of broader business process understanding that Ken Ouchi, vice president and CIO at Milpitas, Calif.-based Solectron, wants for his IT staff.

Solectron provides manufacturing services to resellers in the electronics and computer industry. With 23 sites around the globe and multiple business units, Ouchi says he knew it would be difficult to keep his 350-person IT staff on the same page as the rest of the companies' 30,000 or so employees. "We are growing so fast, bringing in so much new technology. This could be a real frustrating job if you didn't understand what it was all for," he says.

For that reason, before Solectron launches a new technology initiative, it pulls together a team of IT and non-IT professionals from its different business units and gets them all in a classroom together for one week. That way, they not only have a streamlined introduction to the technology, but also clear expectations about what each team member can expect from one another. After that, team members will be able to stay in touch via the videoconferencing system, e-mail and telephone.

Avnet is a multinational company that does both plain-vanilla electronics distribution as well as more complicated OEM supply-chain management. The company has been averaging six to eight acquisitions per year around the globe. The pressure to integrate newly acquired operations into Avnet's fast-growing sales and marketing operation is tremendous.

During the past six months, Avnet has been rolling out a complex SAP AG business management solution across its Asian operations, including several recently acquired operations. To prepare for the rollout, Bandrowczak assembled teams of IT project managers – along with warehouse managers, marketing executives and field sales representatives from Avnet's Asian and U.S. offices. The teams went through product debriefings, simulations and strategy sessions in preparation for the deployment.

Steve Hannah, a former Avnet sales manager turned IT project director, has been overseeing the rollout from his office in Sydney, Australia. He says he believes that Avnet's push for preproject team-building made all the difference in the world when it came time for the rollout. The team just hit its first milestone on time and without a flaw.

Not one of these CIOs will tell you it's easy creating or maintaining a team-oriented environment among IT professionals and their non-IT colleagues. But they all say it's worthwhile. Bandrowczak says a CIO can't expect his IT staff to be able to work through a technology deployment until they understand the "various and different values of the people they support." That, he says, takes time.

But the returns from team-building – improved productivity and staff morale – more than compensate for the time they add to deployment. ●

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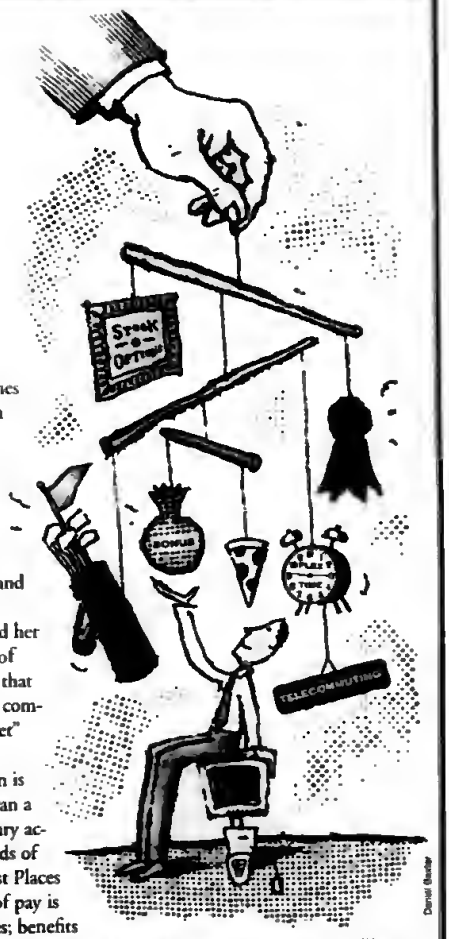

Daniel Baxter

There's no doubt about it: Information technology workers are getting spoiled. And they're loving every minute of it.

Compensation packages are getting bigger and better — and not just in traditional ways. In an effort to recruit and retain the cream of the IT crop, Best Places companies are building bonus incentives, stock options and professional development programs into employee packages.

Those incentives are joining less-formal measures to make workers' daily lives more rewarding. Today's IT staffers are kicking back at golf outings, pizza parties and awards ceremonies. Flex-time and telecommuting are helping them balance their work and personal lives. And rewards are taking the form of everything from cash bonuses to Beanie Babies.

The employer's goal? To attract top IT professionals and motivate them to perform and stay put when the competition comes calling. In fact, many Best Places companies have hired IT-specific human resources directors to be sure they're staying competitive.

Companies are willing to be generous to woo competitive talent. But being recognized even in small ways for a job well done "makes all the difference," says Jennie Jones, a senior systems analyst at Amgen Inc. in Thousand Oaks, Calif. Jones admits that she didn't even know what a stock option was until she joined the pharmaceutical company six months ago. Since then, she's seen Amgen's stock double and split. She's been to Disneyland and a local resort with her co-workers. Jones says she and her team receive "a whole list of thank-you's and 'attaboys' that make you feel you are the company's most important asset" (see story, page 40).

Indeed, compensation is defined by much more than a steady paycheck: Base salary accounts for about two-thirds of total compensation at Best Places companies. Nearly 12% of pay is now derived from bonuses; benefits account for close to 24%. Benefits include medical, life and disability insurance packages, which are starting to extend to spousal equivalents. Retirement savings such as 401(k) plans are becoming the status quo, and employers are beginning to match funds or make contributions based on company performance to pump up that benefit.

The variety of benefits gives companies the flexibility to get creative in their reward policies. For example, Lowell, Ark.-based J. B. Hunt Transport Services Inc.'s average increase in total IT compensation for 1998 jumped to 17% from an average increase of 7.5% in 1997. That's because the company added the IT team to its list of positions eligible for a yearly performance bonus.

On top of cash, the strategies employed by companies have become, well, Pavlovian: Employers have figured out that creative pats on the

Continued on page 38

It just keeps getting better: In a buyer's market, compensation packages are growing fat — and fun — as Best Places companies work to attract and keep IT talent BY JOANIE WEXLER

Continued from page 37

back for top-quality work are almost as valuable as big financial incentives. And the pats don't have to cost much: Dinners on the company and trinkets presented in front of one's peers are going a long way toward maintaining employee enthusiasm. In addition, compensation in forms other than salary give employers some added mileage with limited budgets.

Still, competition has raised the bar for standard compensation packages, too.

Computerworld's 100 Best Places companies say they saw an average increase in total IT compensation of more than 10% last year — considerably higher than the more traditional 4% average salary increase found in *Computerworld*'s 1998 Annual Salary Survey.

Best Places companies say they keep a sharp eye on salary surveys and the compensation activities of companies in similar markets. They report that they continually adjust their compensation plans to meet or beat those of other employers.

Such is the case at J. B. Hunt. "We aim to be the top-paying company in IT in our area," says Kay Palmer, senior vice president of the software development group. She says her company must vie for top resources with local IT heavyweights Wal-Mart Stores Inc. — another Best Places winner — and Tyson Foods Inc. J. B. Hunt also strives to remain competitive with nearby Kansas City, Mo., and Oklahoma City pay scales.

At Amgen, employees are eligible for cash bonuses equal to a percentage of their salary if the organization meets its annual financial goals, says Steven Wecker, Amgen's associate director of human resources, who directs the company's compensation policies. "All employees are also eligible for merit increases and bonuses issued as shares of stock in the company. You could think of our compensation package as traditional but generous," he says.

Best Places IT employees say their performance goals are clearly defined and pay raises are determined by fairly identifiable metrics such as hitting a percentage of on-time installations, saving the company money and becoming proficient in a new skill. In addition to the manager's assessment of the employee, peer reviews, customer evaluations and self-evaluations also enter into the mix at some companies.

At J. B. Hunt, for example, internal customers rate their satisfaction with a completed project, such as the implementation of a new business

CORNING

application. "Does the application do what the customer wanted it to do? Is it easy to use? Was it up and running on time?" says Don Crowley, an IT consultant. The responses are averaged into a scorecard that rates the project and figures heavily in twice-yearly salary reviews.

Like Amgen, many companies offer a companywide bonus plan that rewards employees if the company hits its performance goals. Many IT organizations have also instituted team bonuses on a per-project basis.

For example, Limited Technology Services (LTS), the newly-formed IT arm of The Limited Inc., has a year 2000 compensation package. It's structured to motivate and reward IT associates for completing Y2K conversions on time and within budget. For each deadline met, all IT associates working on Y2K projects receive a bonus based on a percentage of their salary. Come July, when the final deadline arrives, if all deadlines have been met successfully, the IT associates will be rewarded with the same percentage of their salary a second time.

"We were all pretty amazed by this program," says Tracey Collins, a point-of-sale analyst at LTS. "We've met all our milestones so far."

Best Places companies increased total IT compensation an average of 10% last year.

Such programs are helping LTS President and CIO Jon Ricket retain employees. "We've managed to cut attrition in half during a time when recruiting is at an all-time high," he says (see story, page 44).

Best Places companies appear to be offering incentives around every corner. The Limited pays a whopping $3,000 bonus for IT employee referrals. It also ponies up $1,000 toward a home computer for employees. "That's a pretty big deal," Collins says.

J. B. Hunt has some impromptu IT team bonuses, which tend to arrive in the form of comp time spent golfing, canoeing or rafting due to the bucolic setting in Lowell, Ark.

The company also realizes that it must have a handsome relocation program to attract workers from the dazzle of bigger cities to the countryside.

In addition to moving expenses, relocating workers receive a lump sum equal to a month's salary as well as temporary living expenses for 30

Continued on page 41

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The Power of Tchotchkes

Jeff Ketelhut concedes that he sometimes acts like a big kid. But that's OK with his staff, who are having a ball with the toys he hands out as motivational rewards.

Ketelhut, associate director of the global supply chain at Amgen Inc., has discovered the strong motivational power of tchotchkes — cheap trinkets that are oddly irresistible to even the most sophisticated of adults. Ketelhut is practically building a career out of rewarding staff with inexpensive, but meaningful reminders of a job well-done.

Ketelhut's staff has come to compete in earnest for Smoochy the Frog and the company's year 2000 mascot, the Millennium Bear — both Beanie Babies. The Beanies join the likes of puzzles, beer steins, T-shirts and scratch lottery tickets as rewards with inspirational staying power.

But the most cherished goal of all is the department's "spinning pyramid" award: an object that displays a rich whir of colors as it twirls like a top. The spinning pyramid is bestowed upon a worker who has figured out how to save the company time or money.

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"I'm getting more mileage out of a $7.50 spinning pyramid than 100-share spot stock awards," he says. "I think it is because it is a tangible, everyday reminder to the employee that he or she is appreciated."

Ketelhut says part of the appeal is that awards are handed out amid a bit of memorable fanfare. In fact, new this year is the "Cutting Edge Awards," a mock Academy Awards ceremony that took place in March. While the award — a mobile in the form of a person on a tightrope — doesn't hold the monetary value of the famous bronze statuettes, the thought is the same.

The informal awards won't build up anyone's retirement account, but they're appreciated nonetheless. "On a scale of 1 to 10, the way Jeff recognizes performance is a 10," says Jennie Jones, a senior systems analyst — and spinning-pyramid owner.

— Joanie Wexler

Continued from page 39

days, says Alex Mirinoff, IT personnel manager at the company.

Most IT managers' budgets have been padded for spot awards or informal recognition of the employee who has creatively squeezed time and costs out of an IT project or contributed a bright idea. Some rewards take the form of movie tickets, free dinners or comp time. Overall, employers are working hard to inject a feeling of respect in IT workers' daily lives. To make workers feel "connected," Ricker holds monthly, two-hour lunches with selected LTS associates. He also holds birthday and anniversary parties each month.

IT-specific human resources directors are helping companies make sure compensation efforts are competitive. One company reported that it recently added a morale officer to "recognize and celebrate the successes of our staff." Another has built a "quality-of-life" committee to review measures for further improving employees' work/life balance.

Workers are appreciative. When asked what he found to be the most attractive element of his employment at J. B. Hunt, Crowley — who's been at the company for 11 years — didn't mention money. He called it a tie between the fact that "my ideas count" and his employer cheerfully helps him meet his skill development goals with training. At the end of the day, managers have learned that most employees prefer to spend their time on Earth not only surviving, but thriving. That most employees work to live is a fact of life. But there's nothing wrong with having a little fun in the process. ▪

Wexler is a freelance writer and editor in Campbell, Calif. Contact her at joanie@jwexler.com.

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BEST PLACES TO WORK 98

CIRCUIT CITY

Peter Horjus

Food, Fun and Fame

BY CHERYL GERBER

They rode paddle-wheel boats up and down the Mississippi River, played music, performed skits and ate hearty along the way. No, this wasn't Huck Finn, Currier and Ives or 1865.

These were the Musicland Stores Corp. employees in the summer of 1998.

Musicland has a summer event every year and the Mississippi River paddle-wheel boats are a recurring favorite. At Christmas, there's another event. Last year's party featured Big Bad Voodoo Daddy, a swing and Cajun band.

Then there's what Musicland people call The Box Lunch — when recording artists come to perform in the cafeteria for 20 to 30 minutes and sign CDs. There's no telling who's going to show up. Once, it was Garth Brooks. Another time, it was blues sensation Jonny Lang.

Musicland employees love those events. "They build morale and a company team atmosphere," says Kim Dockry, Musicland director of systems development in St. Louis Park, Minn. ▸

Gerber is a freelance writer in Kingston, N.Y.

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Doing Lunch with the Rich and Famous

BY FAWN FITTER

Even though Eden Prairie, Minn., is a long, cold way from Hollywood, employees at the headquarters of Best Buy Inc. have gotten used to seeing stars. The consumer electronics retail giant is the single largest sellet of music CDs in the U.S. — bigger than any of the music-only superstores — so it's not unusual for musical powerhouses to visit to pitch their latest recordings and discuss promotional deals.

Recent sightings have included The Artist Formerly Known As Prince, superstar Janet Jackson and new sensation Johnny Lang, who treated everyone in the corporate cafeteria to an impromptu lunchtime concert.

Also spotted: hoops hero Shaquille O'Neal, center for the Los Angeles Lakers. He showed up seeking advice on home electronics.

Best Buy employees also fraternize with a star of their own, the Best Buy mascot, Tag Man, who can be seen in the retailer's television ads. He shows up for Family Fun Night.

Peter Hoyle

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No Wandering Eyes

Employees at Best Places aren't looking for the next great job — they've already found it BY ALICE LEESCH KELLY

Elizabeth Barber, a senior network support specialist at Cox Communications Inc. in Atlanta, spent months taking classes and studying for a Cisco Certified Network Associate exam. When she found out she passed the test, she was thrilled — and rushed to work to share the good news with co-workers.

"When I came back and said I passed, they were very excited," Barber says. "It was like coming back to family and telling them I passed." Friends in her department gave Barber a pat on the back. But what really stood out for Barber is the fact that the cable company's director of MIS operations, Ray Deaton, acknowledged the achievement by treating Barber, her daughter and a friend to a lavish dinner at a local restaurant. "That meant a lot to me," Barber says.

James Yang

More Than Money

At a time when annual turnover in some information technology shops is as high as 30% and filling empty positions can cost anywhere from two to five times' an employee's salary, IT managers are discovering that it takes more than just a paycheck to keep their people happy, according to Brian Anderson, vice president and general manager of the San Francisco office of Personnel Decisions International, a global management and human resources consulting firm in Minneapolis. IT managers are also finding that offering a buffet of "softer" benefits – anything from on-the-job training to days off to elegant dinners – builds loyalty, makes work more enjoyable and nudges employees to think twice about sending off a résumé when a headhunter calls.

Turnover rates at the *Computerworld* Best Places to Work are dramatically low compared with other companies — 50% to 75% below the national average. What are the secrets? We took a look and came up with four of the most effective ways to keep IT turnover low.

Companies with low turnover rates stress training, internal promotions and other strategies that prevent employees from growing stagnant in their jobs. For example, at Crown Central Petroleum Corp. in Balti-

more, 80% of employees have been with the company five years or more. Crown Central spends between $5,000 and $10,000 per year on training for each of its IT employees. Tim Fuller, director of information systems, says it's money well spent because a well-trained employee is a happy employee.

"We train people well and keep them technologically challenged, which they like," he says.

IT employees also seem to enjoy working at companies that stay up-to-date on the latest technology. "We're on the razor's edge of every technology you can think of," Deaton says. Cox's IT shop has a 3% turnover rate.

Crown Central Petroleum's commitment to training is one of the reasons that Nancy DeMarco, year 2000 project manager, has stayed put for 21 years. "You don't have to change jobs to learn something new," she says. "I feel like I've had the complete gamut of experiences. I have touched and managed every facet of the IT business."

Phillips Petroleum Co. in Bartlesville, Okla., whose IT staff turnover is just 6%, uses "gap analysis" to compare an employee's skills with the skills his job requires. If there's a gap, the employee receives the appropriate training, says Frank Barbee, manager of IT. "We won't place people in a job without the skills because that makes them frustrated and fearful, and they may want to leave us," Barbee says. What's more, Phillips offers training in management as well as technical skills. "A lot of people think anyone can be a supervisor, but that's not true," he says.

Companies with low turnover rates also tend to provide extensive training for entry-level employees, promote from within and offer nonsupervisory technical tracks in which people who don't want to be managers can still be promoted to high levels in the company. For example, at Phillips Petroleum, nonsupervisors can be promoted to a position as high as vice president.

More and more companies are realizing that bankers' hours just don't work for many people and that allowing flexible schedules is key to employee happiness. Take Barber, for example. As a single parent, she needs flexibility. "I have certain issues that come up from time to time, and they're always very flexible with that," she says.

Getting It Done

Flexibility is built in at Phillips Petroleum, too. "My philosophy is, if you give someone a job to do, let them do it. We don't believe in micromanaging. We're very flexible as long as the work gets done," Barbee says. "We don't push the issue of 8-to-5; we push the issue that if you have a job to do, you get it done."

In companies like that, employees are often free to set their own schedules, work part time or telecommute from home. Some companies even install Integrated Services Digital Network lines in employees' homes for fast Web connections and provide laptops for at-home work.

Indeed, companies realize that if they're going to ask an IT employee to work on weekends or pull an occasional all-nighter, they've got to give something back. At Crown Central, employees who sacrifice personal time are given comp time in return.

"Working weekends is sometimes the norm rather than the exception," Fuller says. "If I burn you out, you're going to leave. So I have to be aggressive in how I keep people motivated to keep working those hours." At Crown, long hours are rewarded with days off, cash bonuses and even weekend vacations. "I work these people to death, but I very seldom hear, 'No, I'm not going to come in this weekend,' " Fuller says.

Companies with happy IT employees offer lots of rewards. But as DeMarco says, "It's not just the dollars. It's more a matter of giving

Continued on page 46

Beyond Technical Training

Companies with low turnover rates tend to offer lots of technical training. But providing employees with the opportunity to keep up with the latest technical advances may not be enough, according to Brian Anderson, vice president and general manager of the San Francisco office of Personnel Decisions International (PDI), a global management and human resources consulting firm in Minneapolis.

In a recent study on IT turnover, PDI found that even the most technical of IT employees also want training in nontechnical areas. "Technical people realize that nontechnical development is critical in their career development," Anderson says. They want to learn how to analyze problems, manage projects, work as teams and communicate well, he says.

"Technical skills are the price of admission, but to continue to move up and do the kind of work they want to do, receiving professional development in those other areas is very attractive," Anderson says.

But are companies giving IT employees that nontechnical training? No, Anderson says. "In our IS research, we found that 96.5% of people said it was critical — but only 41.6% are getting it," he says.

That's too bad, because such training pays off in the long run. "We found that focusing on professional development has a higher return on investment than hiring and training new employees," Anderson says. "It's got a low cost and a high return."

Most managers at Best Places companies have already figured that out. They offer plenty of nontechnical training. For example, Phillips Petroleum in Bartlesville, Okla., offers training in management as well as technical skills. ▸

Continued from page 45

employees lots of responsibility and then rewarding them when they do well."

At Crown Central, employees are rewarded with stock grants, dinners, weekend vacations and cash prizes, among other things. Other companies mention star IT performers in their company newsletters, send out e-mails about noteworthy accomplishments and award prizes. "If you do a good job," Barbee says, "we want to recognize you."

And it's not just the managers doing the recognizing. At Crown Central, for example, anyone in the company can recommend anyone else for an award. For example, DeMarco recalls an IT staffer who received an award for almost singlehandedly implementing a financial application in the accounting department. Who nominated her? Her satisfied users in the accounting department. That kind of recognition is key, Anderson says. "By having IS people recognized more by the line units they serve – that's incredibly powerful," he says.

For many IT employees, the bottom line is enjoyment. If they enjoy their job, they'll stay – and if they don't, they'll move on. That's why companies are working to build good working environments. At Phillips, for example, the company supports local cultural events and urges its employees to do the same. "We go out of our way to encourage people to get involved in the community because we believe that the more they get involved, the more likely they are to stay," Barbee says.

Open communication between employees and managers is also a plus. At Cox, Barber says she has free access to all levels of management. "This is the first company I've worked for where you can go up to the director and talk to him about anything," she says. "You don't have all the bureaucratic levels."

Beyond that, Cox offers employees whatever might make them happy. "We moved to new facilities; everyone has state-of-the-art equipment – they get everything they want," Deaton says. "But we do a hell of a job, and we're accomplishing a lot."

At Crown Central, Fuller tries to make the workplace fun. He organizes events and promotes activities that build pride in the IT staff and give them time to let off some steam, such as family social events and department picnics, during which Fuller volunteers to man the dunking booth.

"One of my guiding principles is, Have fun," Fuller says. "We work hard, but you gotta have fun, too." ♦

Kelly is a freelance writer in Newton, Mass.

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Peter Horjus

I Could Have Danced All Night

BY LESLIE GOFF

A black-tie dinner-dance for the employees of Lincoln Electric Co. is such an entrenched part of the corporate culture that last year, more than 1,650 people braved a winter storm in Cleveland to attend the 82nd annual event.

"The dance is part of our environment, and the attendance in the storm is just part of the 'getting-it-done' attitude that we have," says Chuck Mehlman, Lincoln's CIO.

Last year's dance, at the Renaissance Hotel in downtown Cleveland, featured two DJs. The company's chairman and CEO, Anthony Massaro, delivered a state-of-the-union address, and more than 70 employees were recognized for 25 years of service to the company.

"It's like a prom," says Maureen Bagley, a systems architect who has been at Lincoln for nine years. "All the local tux dealers run specials, and it's really fun to see everyone all dressed up. You don't even recognize some people — especially those who work in the shop behind a welding helmet." ▸

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Relieving The Pressure

Stress is a complaint in most IT departments. Best Places companies take some unique and fun approaches to stress reduction BY MARY BRANDEL

Peek inside the Best Places to Work in IT, and you'll find people singing in the hallways, dressed up like firefighters or enjoying an upper-body massage.

Shouldn't those people be working on year 2000 compliance or a new e-commerce system or something? Well, in a sense they are. Because wherever there's an information technology department, there is stress. And wherever there's a good IT department, there's plenty of stress relief.

"There's tremendous pressure today to increase speed to market," says Paul LeFort, CIO at UnitedHealth Group in Minnetonka, Minn. "You get one project done, and you don't get a chance to coast. You're on to the next one."

Combine the need for speed with fewer resources, higher turnover and fast-changing technology — not to mention things like Y2K deadlines and unexpected mergers — and you've got a real pressure cooker on your hands. So, while top companies expect and accept a certain level of stress, they're also very good at creating environments where workers can be most creative and productive.

Sometimes that means letting them know when it's time to blow off some steam. Not everyone pulls out the fire hats and water guns. But that's what Bridget Rivet, lead manager for the Y2K project office at Aetna Inc. in Hartford, Conn., did when she was preparing her team for "fire drills" — times when it would have to act quickly to satisfy an important demand. "When we have to hop-to, we pull out the supersoakers and get on with the task at hand," Rivet says. "It helps people keep things in perspective."

A good stress reduction program is a humanitarian goal — and an economic one. "Stress translates to turnover," says David Dell, research director at The Concours Group, a management consulting firm in Kingwood, Texas. "It takes a 20% or more increase in salary to lure somebody away from a company. It takes practically nothing to get them away from a place where they are not happy."

Some stress minimizers are practically check-off items: telecommuting, flexible hours, fitness centers. Other common practices include health-related seminars, mentoring programs and casual-dress policies.

But the least stressed-out environments can be found when the employer acknowledges that stress is a factor and regularly monitors it. Unfortunately, such proactive attention is unusual. "Where most companies find out about stress is in the exit interview," Dell says.

At UnitedHealth, managers are trained to look for early signs of stress, and the company conducts stress surveys. Questions include "When you are under stress, is there someone at work you can talk to?" and "Is job stress affecting your health?" And perhaps most important, "Do mistakes happen because of stress on the job?" At the end of last year, 35% of workers said they were under a lot of stress, but 85% said they could talk to someone at work about it to figure out a solution.

Other companies use more intuitive measures. At St. Paul Cos., a $9 billion property and casualty insurer in St. Paul, Minn., IT is divided into teams. "When there is stress, it's obvious to the managers," says Carol Sjowall, vice president of application development. "We have weekly management meetings, and one of the concerns is always, 'How are people doing? Is there a reasonable level of stress?' "

For the times when the answer is no, St. Paul offers employees tools to manage and perhaps avoid stress-induced anguish. In addition to basic stress management courses, "we provide lectures on how to deal with teen-age children and aging parents, topics that cause people stress in their daily life," Sjowall says.

Also, IT employees can attend ethics classes, which are intended to decrease their agitation when they face issues such as handling confidential information and appropriate use of e-mail and the Web. "If you think about the number of situations that an IT professional winds up dealing with, many are sticky from an ethics perspective," Sjowall says.

Lectures and seminars are popular among IT employees, who say their lives are easily thrown off balance by their jobs. "I get obsessed with what I'm doing," says Andre Archambault, manager of visionary videoconferencing at UnitedHealth. For nearly three years, Archambault fought an uphill battle to get videoconferencing to be commonly used throughout the company. Now that it's taking off, so is his stress level.

"We beam into 37 cities worldwide. If there are 40 people in one room and 40 in another, and the system doesn't work, that's pretty stressful," he says. On the other hand, Archambault also has small children at home. "When you love two areas of your life, it's hard to balance them," he says.

In search of that balance, Archambault recently attended an hour-long session on stress management. As a result, he plans to take all five weeks of his vacation this year and is trying not to pick up voicemail as much. "I'm spending more

Continued on page 50

Common stress-reduction techniques

Benefit	Best Places offering it
Flexible hours	97%
Telecommuting options	89%
Fitness center	69%

time with my kids," he says.

Such was not the case last year, when Archambault lost vacation time because he didn't take his allotted weeks. Now "I'm more sensitive to it than I was before," he says. The stress management course taught him "not to just think about doing things, but to actually do them," he says.

It's also possible to sweat off your stress. But although many companies offer fitness centers, Aetna is one of just a few to staff its gym with licensed physical fitness experts. They "work with you as far as anything you want to do with your body or mind," CIO John Brighton says. And who can beat a neck massage? Tied to the fitness center is a free upper-body massage, offered during the day, three to four days per week.

Other programs are less obviously related to stress reduction. For example, San Francisco-based Chevron Corp.'s IT arm, Chevron Information Technology Co. in San Ramon, Calif., encourages IT workers to spend one hour per week volunteering in community programs, such as helping with school reading programs and setting up computer laboratories. "The psychology behind it is that they get out of the office and give to somebody rather than keep producing," says Greta Mayfield, a communication consultant at Chevron.

"It may sound odd from a stress-relieving perspective," says Sjowall at St. Paul, which also offers a volunteer program. "But people find such fulfillment from community involvement. From a life-enrichment perspective, it's a big deal."

Creative approaches like these are the wave of the future. In the past, stress-sensitive companies mainly focused on offering time-savers, in recognition of IT workers' long hours. Examples include on-site services such as dry cleaners and boutiques. However, you can throw people all the conveniences in the world, but if they don't feel in charge of their own time, they will still be stressed out, says Sue Keever, president of The Keever Group, a Dallas-based human resources consulting firm. "More than anything, people want control of their time," she says.

There are lots of ways to offer that kind of control, Dell adds. "For some people, it's the freedom to see their kids in a Little League game. For others, it's a month and a half to go back to the country where their parents live. Companies need to allow that."

Indeed, empowering employees with a sense of control is a cornerstone of stress management. "The thing that reduces stress the most is giving employees clear direction and the support to get it done," LeFort

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says. That's why UnitedHealth is so strict about managing the IT workload and the scope of projects. "What we're very tight on is that once we get out projects lined up for the year, we won't put others on the plate unless we take something off," LeFort says.

That type of management oversight is key. "People need to feel that they can manage their own environment and that the likelihood of succeeding is OK," Dell says.

LeFort concurs: "When you're under a lot of stress and can't be successful, it's five times worse than not being successful." That type of control can only come to fruition through the CIO, who needs to allow the IT staff to share in decision-making.

"The way to deal with stress is for the IT department to become much more of a player in determining what the priorities of the organization are and doing the work that is important," Dell says.

Just as important, Dell says, is being clear on the project's duration and giving people a sense of progress and accomplishment until it's completed.

What stress-reduction comes down to is taking care of people along personal, professional and financial lines. And if all else fails, there's always humor.

For example, after a particularly grueling project at St. Paul, the fatigue level was very high. So the management team got together and wrote a song about all the obstacles encountered during the course of the project. The tune: *The Beverly Hillbillies'* theme song. "We gathered everyone in the hallway, and four managers sang this song. Laughter is the best stress reliever of all," Sjowall says.

It's also a good way to make employees feel like a whole person. "You really need to come back to the sense of, 'Am I appreciated as a person? Am I going to be OK if things aren't on schedule?' " Dell says. "Companies that do not address that will have enormous turnover."

Mark Lunenberg

Brandel is a *freelance writer* in Norfolk, Mass. Contact her at brandel@cwix.com.

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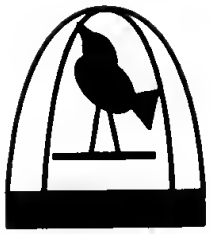

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It's Party Time!

BY LESLIE GOFF

Two years ago, Harriet Edelman, Avon Products Inc.'s then interim CIO and senior vice president of global operations, gave database analyst Debra Pinon a new mandate: "Throw a holiday party."

Pinon booked a room at the Knights of Columbus lodge in nearby White Plains, hired a DJ and caterers and organized hourly gift drawings. About 200 IT staff members showed up. It was such a success, Edelman gave Pinon the go-ahead for a spring party.

This time she found a swankier locale, the Glen Island Harbor Club on the shores of Long Island Sound in New Rochelle, N.Y. She hired a team of DJs who wore giant celebrity heads — like Frank Sinatra and Carmen Miranda — and performed skits.

And in the fall, Edelman asked Pinon to do it again. This time they had a beach party. Now the get-togethers have become annual events.

"In a rather deliberate and pulsed way, we are doing something significant of a fun, you-never-know-what-we-are-going-to-do-next nature," Edelman says. "It really goes back to the friendly spirit of Avon. ›

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Financial Services: Big Payoffs

These financial services companies are riding the technology wave and taking their employees along for a ride full of perks and training BY TOM DUFFY

There was a time when financial-services institutions — banks in particular — weren't exactly known for embracing cutting-edge technology. But with millions and, in some cases, billions of dollars at stake, they could hardly be blamed for their recalcitrance.

But more and more, financial services firms have grown reliant on technology, whether they're selling commercial cash management services or providing Internet-based banking. They're driven by the need to maintain profits as well as a growing emphasis on e-commerce. The result: Firms are pouring billions of dollars into hardware and software and, in the process, attracting an increasing number of highly talented workers.

"Technology is primary to our business — and in many cases it is our business," says Steven Sheinheit, an executive vice president at The Chase Manhattan Corp. in New York. "Many of our businesses are transaction- and information-based."

Chase, the nation's third-largest bank, last year spent $2.6 billion, or roughly one out of every four expense dollars, on technology. Of its 73,000 employees, one in seven works in information technology.

The situation is similar at Fannie Mae, formerly the Federal National Mortgage Association, the nation's largest supplier of home mortgage funds. Approximately 1,200 of its 3,500 employees work in technology, which accounts for 20% of the Washington-based agency's spending. Those kinds of numbers, and the opportunities they provide, are attracting growing ranks of IT workers. Database managers, systems integrators and object-oriented developers are some of the most sought-after workers at such companies. And for those without the proper background, there's often training.

Just look at Shadonna Logan. She came to Fannie Mae from Washington's Howard University after graduating in 1992 with a bachelor's degree in business administration and computer-based information systems. Upon arrival, Logan spent four months in the Business Systems Technologist program, which is primarily geared toward young workers with little technical background. She learned the basics of Sybase and systems analysis.

Brian Rasizka

Her training complete, Logan joined the development group at Fannie Mae's mortgage-backed security portfolio systems, a mission-critical operation that in February handled nearly 81,000 transactions amounting to $78 billion.

Handling that kind of money can make work in the financial services field stressful, says Jeffrey Leon, managing director at Russell Reynolds Associates, a New York recruiting firm. "In the normal course of a day, you've got trillions of dollars of securities and cash and foreign exchange zipping around wires. And if some of that goes wrong, the cost is enormous," he says. Maybe so. But the stress doesn't seem to be getting to Logan. "It's actually very exciting," she says. "This is a hot market."

Hot, financial services firms still tend to be somewhat conservative when it comes to the work culture. "You don't see basketball hoops in the hall," says Cathy Mattax, Fannie Mae's director of corporate IS.

Still, Fannie Mae works hard to make its environment comfortable. New employees are assigned a peer mentor to help them learn everything from where to park their car to the hours of the company cafeteria.

Workers can also be matched with a more senior corporate mentor whose purpose is to help guide their protégés' careers.

In addition, Fannie Mae conducts semiannual reviews of firms in the area to make sure its pay isn't lagging behind, Mattax says. Throughout the sector, compensation is generally seen as more than fair.

"The pay in financial services is generally better than almost anywhere in terms of cash compensation," Leon says.

Fannie Mae employees also are eligible for a forgivable loan of up to $11,000 to cover the cost of the down payment on a house and associated closing costs, a natural benefit for a company that's in the business of encouraging home ownership.

At Chase, the environment provides a variety of opportunities for employees to work on innovative technology, says Sultan Khan, Chase's vice president of enterprise information technology architecture.

"We have a significant presence in data warehouses and data mining, a heavy focus on service centers and call centers, and we're investing very heavily in e-commerce technologies," Khan says.

Chase also offers a variety of training opportunities. IT workers have access to more than 70 two- to five-day technical training courses. In addition, workers are encouraged to take advantage of a professional development program that deals with nontechnical issues such as customer service and project management.

Khan, who has been at Chase 19 years, says another benefit is that he and others are often given the opportunity to get more involved in the business side. Three years ago, Khan did a stint as a technology manager for electronic cash management solutions.

Among other things, he made product presentations to customers, established pricing for certain items and ran customer focus groups.

Khan says the experience gave him a better understanding of how business needs drive technological demands.

"Over the years, I've had such a diverse set of experiences that it's almost like I have been changing jobs the whole time," he says.

Duffy is a freelance writer in Northampton, Mass. Contact him at tduffy62@compuserve.com.

Retail: Minding the Store

Retail companies are attracting and keeping IT employees by giving them a chance to work on some of the latest, greatest technologies

BY FAWN FITTER

The IT department at Best Buy Inc. is hiring at a torrid pace — 15 to 25 people per month, says Marc Gordon, senior vice president and CIO. What's more, candidates are flocking to the fast-growing consumer electronics retailer even though it's in frozen Eden Prairie, Minn., and not balmy Silicon Valley. What's the appeal?

"Even though we just hit the $10 billion mark, we've got the fast-paced, high-growth atmosphere of a high-tech start-up," Gordon says. "It's competitive, demanding, dynamic . . . it occasionally borders on the chaotic. IS is retail's life's blood."

Information technology in retail was once a backwater of outdated systems, aging proprietary software and unchallenging work that primarily involved keeping track of inventory and pricing. The industry was slow to embrace IT as a strategic business objective. However, many retailers have become aware that they're swimming in a vast pool of data — what items sell best in which locations, where employees' skills are needed most, how to make customers return again and again — and that using that data efficiently can increase their profits exponentially. As a result, IT is no longer a mere supporting player.

Gathering, storing and using information has taken center stage in plotting long-term retail strategy. Aggressive recruiters and hiring managers are luring IT staffers with the

Continued on page 56

Continued from page 55

opportunity to apply hot technologies like data warehousing, e-commerce, supply-chain automation and customer-relationship management in a fiercely competitive industry, says Cathy Hotka, vice president of IT at the National Retail Federation, an industry trade group.

"Retail is one of the few industries where IT makes a difference in the bottom line. And every CEO in retail now knows the business is only as good as the IT shop," Hotka says, adding that her organization's council of prominent retail CIOs is "up front about using the opportunity to work with hot technologies to lure the best IT folks away from other industries."

Sears, Roebuck and Co. in Hoffman Estates, Ill., one of our Best Places companies, is in the forefront of the move toward using IT more dynamically. "One of our biggest projects right now is leveraging customer information," says Bill Brannen, director of workplace transformation. "We have 100 million households from which to extrapolate marketing techniques, demographics and so forth." In addition to building a data warehouse for customer information, Sears is also moving aggressively into e-commerce. It already sells tools, toys and repair parts online and is about to launch a site that allows people to research and buy appliances via the Web and connect directly with repair technicians and nearby stores.

This is an effort that lets the company's IT staff experiment with the newest tools and techniques, a hallmark of our Best Places companies.

But retail isn't an industry that invests in technology for technology's sake. "We're not racing to be the first to implement the sexiest solutions," says Amy Todd, a manager in IS logistics at The Home Depot Inc. in Atlanta. "We're doing what the business requires." Retail is, however, an industry that has vast needs for practical applications.

Home Depot, for example, is developing systems for everything from transportation and labor management to a returns/refunds system. Much of the work is done in-house, because most software vendors can't provide solutions scaled to an organization that completes 40 billion transactions per year, says Ron Griffin, senior vice president and CIO.

The industry is middle-of-the-road when it comes to salaries; as Griffin says, "Twenty-five percent of IT organizations pay a higher base salary than we do, but those are either start-ups or consulting firms."

In addition to performance-based bonuses and employee stock purchase programs, Best Places companies tend to be generous and innovative, with flextime, job sharing, telecommuting, limits on overtime and other work/life initiatives. And, of course, most retailers offer employee discounts on their merchandise — an appealing perk for the acquisitive.

Notably, retailers want their IT staff to be familiar with not just bits and bytes, but also with the product line and end users.

That's why Home Depot requires every IT employee to work in a retail store for at least a week and why Sears' mandatory 10 days per year of IT training includes time behind the cash register.

As IT entrenches itself ever more firmly at the strategic heart of the retail business, that business knowledge will serve staffers well. Just consider Jerry Miller, Sears' vice president of information systems logistics. Thanks to his combination of technical skills and business savvy, he was recently promoted to CIO. ▸

Fitter is a freelance writer in Boston. Contact her at fsquared@netcom.com.

Continued on page 59

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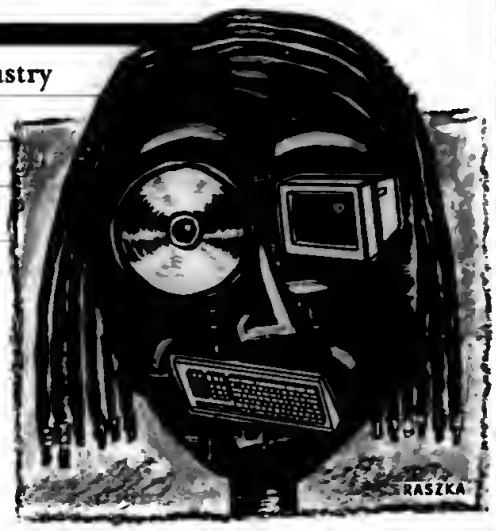
High Tech: A Delicate Balance

Best Places in the technology industry may work IT employees hard, but projects are challenging and the pay is great BY FAWN FITTER



Brian Raszka

The pace of innovation and the demand for ever-more-powerful technology have kept the high-tech industry booming with opportunities and challenges. It's no surprise that technology firms — hardware, software, services and manufacturing — are well-represented on the 100 Best Places to Work list.

The fast-paced world of high tech requires a lot from information technology professionals. Workweeks often are 60 hours — even more when a project is in its final stages — with key employees on call around the clock. Projects are driven by the demands of clients who want applications custom-designed and flawlessly integrated with legacy systems on the tightest schedules imaginable. An acute skills shortage makes job-hopping common.

"There's more work than anybody can do," says Robert Monastero, director of human resources for information management at Xerox Corp. in Stamford, Conn.

There are two separate career paths in such companies: The internal IT support pros are focused on all the hot technologies popular in every industry: Web-based technologies, network design and infrastructure and anything related to e-commerce and knowledge management systems. On the development side, companies need research-and-development experts, software engineers, application developers, beta testers and quality control staff.

In an industry in which networks and telecommunications are completely updated every year or two and organizations are regularly reorganized, decentralized or globalized, that can mean a breakneck pace and relentless pressure. But Best Places companies make up for that pace by offering employees ample opportunity to work with talented colleagues in a team-oriented atmosphere while developing new skills — which is always a résumé-boosting plus.

"People who come to work for us can expect they'll be doing challenging, leading-edge work," says Howard L. Niden, partner in charge of systems integration practice at PricewaterhouseCoopers in New York.

Because these are the companies developing the newest technologies, it's vital that their employees be ready and able to pick up a new skill quickly. Companies on the Best Places list stress individual training plans that not only measure the skills people already have, but also determine what kind of training they'll need in the future and how they'll receive it. Each new hire at PricewaterhouseCoopers receives 12 weeks of training, with continuing education and annual career planning meetings thereafter. And at NCR Corp. in Dayton, Ohio, documented requirements for each job provide a map for progressing in a position and for moving among positions. Salaries and promotions depend on meeting those benchmarks, says Vice President and CIO Sam Coursen.

Salaries are another lure to potential hires in this industry. Because technology firms scramble to find and keep the best and brightest, companies keep a close eye on the compensation packages offered by their direct competition and by the larger IT world. At PricewaterhouseCoopers, a recent salary survey led to raises averaging 13% to 14% to bring salaries more in line with the competition, Niden notes.

Xerox pays salaries in line with the top 20% of all IT shops, users and vendors alike, Monastero says, but the company sweetens the deal further with a benefits package that *Money* magazine dubbed one of the

Continued on page 60

Continued from page 59

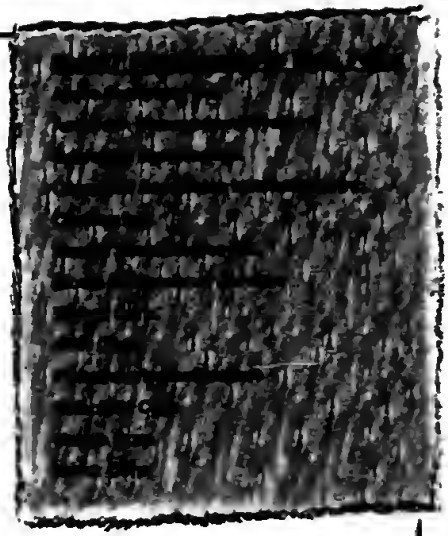
best in the nation. In addition to their base pay, IT staffers receive stock options equal to 2% of their base salary, profit sharing of up to 10% of their salary and a bonus — based on individual, departmental and corporate performance — of 12% to 14% of their base salaries.

Benefits also include adoption assistance, child and elder care, flextime and telecommuting, work/life balance programs and generous insurance coverage.

IT managers at Best Places companies say their staffers consider it important to be working for an IT company — not just a company with an IT department. It means their skills will be nurtured and used anywhere in the organization, whether they're creating software, building a data warehouse or automating the sales process. It also implies that working in IT in no way prevents them from climbing the corporate ladder into management.

That's demonstrated by an NCR program that sends 40 to 60 people per year from the IT shop to work for a time in other departments while their counterparts from those departments experience what it's like to work in IT.

In fact, though IT staffers in the tech industry are seen as providing a service rather than creating a product, they're gaining influence on the business side of the industry.



"We're in a transition from office equipment to 'document management' solutions," says Gary Banks, Xerox's CIO. "Our target market has changed from the office supply buyer to the CIO . . ., [so] we're spending time training the salesforce. There's a place for IS on Xerox's operations committee for the first time, which gives us the proverbial place at the table in strategy and business issues." ›

Utilities: Lighting the Way

Deregulation has Best Places to Work in the utility industry putting the focus on technology, which means bright opportunities for IT employees BY STEVE ALEXANDER

Utility companies are entering a deregulated era that they say bodes well for their information technology employees. Competition among utilities, fueled by government deregulation of the industry, will force the firms to adopt new technologies and thus create IT job opportunities, according to IT executives.

But they concede that competition could create mergers that would cut the number of IT jobs, although Best Places to Work in the industry aren't finding that to be the case now.

Among the new technologies the utility industry is pursuing are Web-based bill payment and the integration of billing systems to handle bundled services, such as the combined billing of electricity, telephone and electronic home security services.

"The changes that are ahead for our industry require substantial changes in technology," says Joe Wiley, director of information systems at electric-power utility Teco Energy Inc. in Tampa, Fla. Teco sought to be more competitive by extending the functionality of its work order and work management systems. Other IT opportunities will be created by the company's pending SAP implementation project, says Merlin Wadsworth, Teco's vice president of corporate and operating service and CIO.

Michael Heim, a utilities analyst at A. G. Edwards & Sons Inc. in St. Louis, says IT is doing well in the utilities industry now but that the future is clouded. "It's true that utility computer systems are changing rapidly due to deregulation," he says. "But who knows how long that will last?"

Deregulation can also mean uncertainty for IT workers as competition forces companies to merge — something that ordinarily might mean a loss of IT jobs.

Continued on page 62

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Continued from page 60

But company executives at Energy Holdings Co., formerly CalEnergy Co. and MidAmerican Energy, say that won't happen there. The Des Moines, Iowa-based electric power-generating firm is a new company formed by CalEnergy's acquisition of MidAmerican Energy.

Instead, Robert Beck, corporate director of information systems at what was Omaha-based CalEnergy, predicts the IT staffs of both companies will remain the same because IT will be vital to new technology adoption. New MidAmerican Energy IT projects in the deregulated era will include e-commerce and new billing systems that allow payment for bundled services such as electricity, telephone and electronic home security, on a single utility bill. "We're going to need some pretty savvy middleware and integration people," Beck says.

That translates into opportunity, says Rick Sliva, a network engineer at MidAmerican Energy. "With deregulation, you need to build a solid infrastructure, so I think I get to do more things working here than I would someplace else. For example, there's a big push for more network management and desktop server management to limit the amount of downtime."

Wiley also says deregulation will mean new opportunities for IT people to learn technological and business skills.

"The utility industry is the place to be now because we're going through so much change," he says. "While it sometimes can be stressful in terms of work, there is the opportunity to learn a lot."

Utilities promise training to accompany the IT initiatives deregulation will require. At Public Service Company of New Mexico, an electric and gas utility in Albuquerque, IT projects for the deregulated market include a customer information and billing system and a materials and work management system. "We're doing a lot of Oracle training and training on the applications themselves," says John Ortiz, director of IS.

The deregulation era "is an extremely busy time for us," says Tonye Crooks, an IT team leader who heads a group of eight programmers at Public Service. Her team will be doing more Web development, which will allow utility customers to review and pay their bills online.

Utility executives agree that their industry is known for salaries that fall around the middle of the IT compensation scale. Wiley says Teco tries to compensate for its midrange salaries by offering telecommuting (used by approximately 15% of the IT workforce), flexible work hours and bonus programs that let IT people earn up to 10% of salary in addition to their annual base pay.

In addition, Teco recently revised the salaries of approximately 12% of existing IT workers, giving them raises of 5% to 15%. Public Service raised salaries by 4% to 30% for approximately 40% of the IT staff.

Besides pay, another utility industry benefit is fairly regular hours. Though the utility firm operates 24 hours per day, few IT people are called to work nights or weekends, Wiley says. "Our IT people usually work between the hours of 7 a.m. and 6 p.m., and most leave for the day at 4 or 4:30 p.m." he says.

Crooks agrees. "When everything is going good, you work about 44 hours a week, which is not bad. We also don't work a lot of weekends."

What the utility industry doesn't offer is a place for specialists, Wiley says. "If you only want to work on one aspect of Oracle, this is not the place for you," he says. "But if you want to work on Oracle, Sybase and DB2 and understand the intricacies of integrating them, this is the place for you."

Alexander is a freelance writer in Edina, Minn. Contact him at s_j_alexander@rocketmail.com.

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Playing the Part

BY FAWN FITTER

The information technology folks at The Home Depot Inc.'s Atlanta headquarters really get into the Halloween spirit. Every year, members of the department dress up in wacky costumes, decorate their cubicles and stock up on sweets in order to host a party for kids from inner-city schools, who might not otherwise have a chance to go trick-or-treating safely.

But the real fun is for the adults. In recent years, the IT staff has developed a tradition of putting on a Halloween play, complete with over-the-top action and fake gore. In true "Hey, kids, let's put on a show" custom, they write the script, make the props, provide the costumes and rehearse on their own time before presenting three or four performances to their colleagues in the course of a week.

Last year's production, the biggest hit so far, was a comedic thriller dubbed "Delilah's Dead-End Drive-In."

"It's hysterical to see the people you work with in a day-to-day role up on stage," says Amy Todd, a manager in the logistics IT department. "People you'd never imagine would do it get up and dance around." »

Advertisers Index

Advanced Technology Systems ..... Page 39
AETEA Information Technology Incorporated .... Page 28
Allstate Insurance Company ..... Page 20
AuditForce Incorporated ..... Page 63
Avnet ..... Page 48
Capital One Financial ..... Page 7
Cigna Corporation ..... Page 32
Circuit City Stores Incorporated ..... Page 41
Clarendon Potomac ..... Page 14
Computer Task Group ..... Cover 4
Corning Incorporated ..... Page 38
Countrywide Home Loans ..... Page 25
Deere & Company ..... Page 18
Deloitte & Touche LLP ..... Page 21
Emerald Solutions ..... Page 61
Ernst & Young LLP ..... Page 52
FedEx Corporation ..... Page 16
Franklin Templeton Group ..... Page 33
Freelance Technologies ..... Page 53
Frontier Corporation ..... Page 31
J.B. Hunt Transport Services Incorporated ..... Page 43
JobCircle.com ..... Page 27
Mastech Systems ..... Page 57
Matrix Corporation ..... Page 24
Mitre Corporation ..... Cover 2
Moore ..... Page 36
Nordstrom ..... Page 15
PECO ..... Page 47
PricewaterhouseCoopers ..... Page 11
Raymond James Financial ..... Page 42
Rite Aid Corporation ..... Page 58
SBC Communications ..... Page 9
Sears Information Systems ..... Page 46
Sun Microsystems ..... Cover 3
TJX Companies Incorporated ..... Page 19
United HealthGroup Corporation ..... Page 40
Universal Health Services Incorporated ..... Page 51
User Technology Associates ..... Page 17
XLVision ..... Page 63

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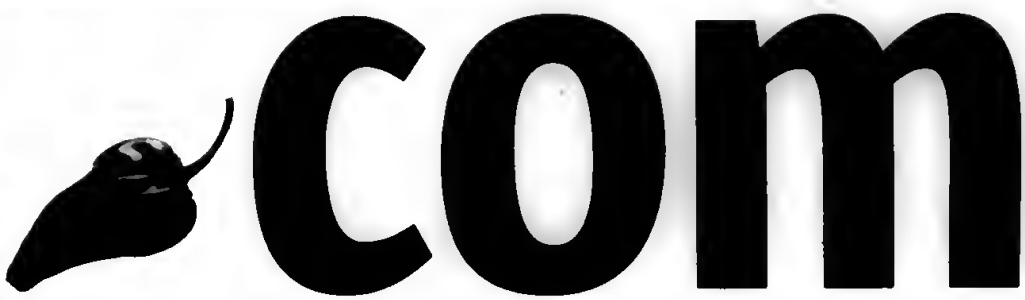

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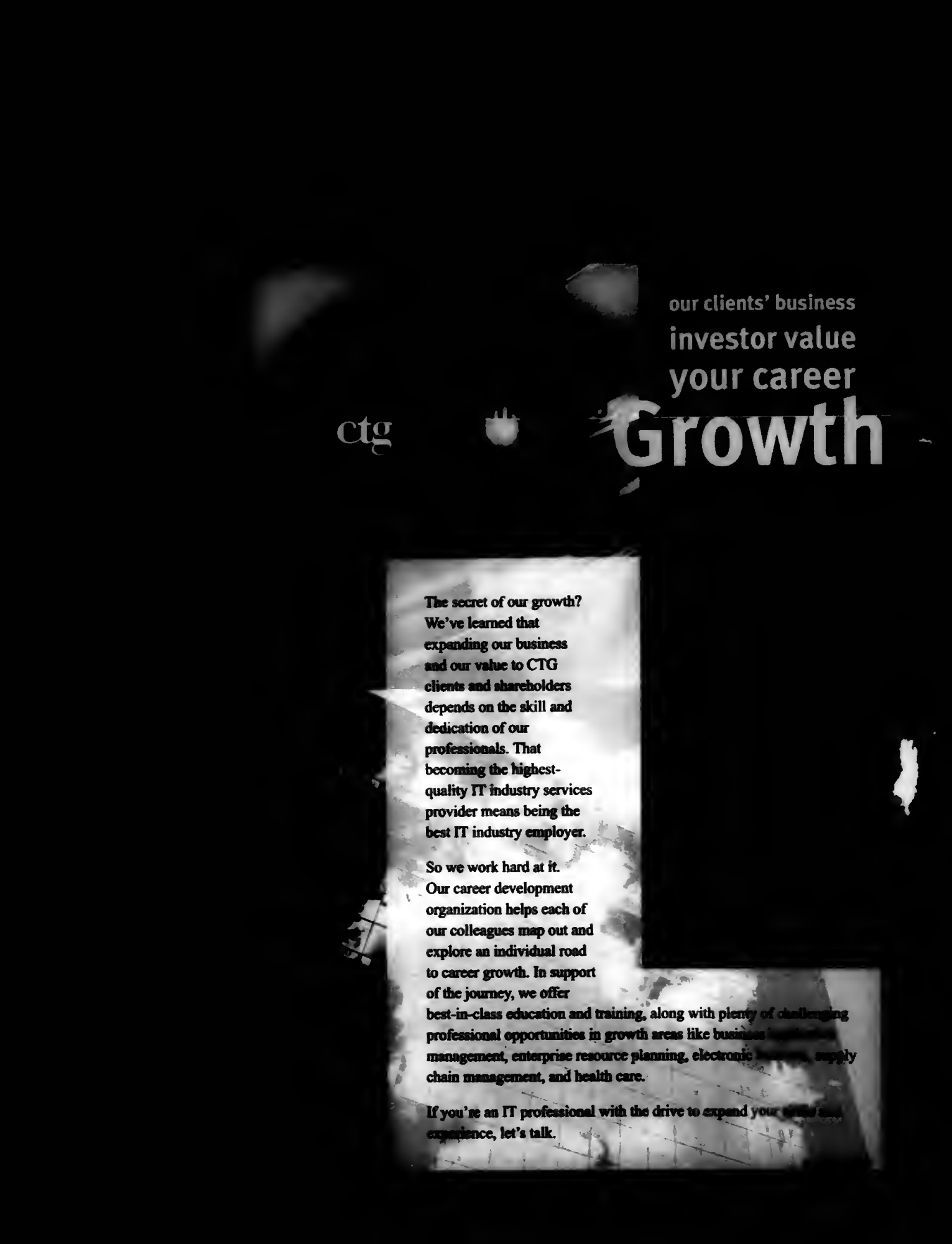
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BUSINESS

THE BATTLE FOR THE STAPLER

In launching its Web site, office products retailer W. B. Mason needed to go beyond the capabilities that giants Office Depot and Staples already provide. So it did — and for $200,000, compared with an estimated $10 million spent by each of the market leaders. ▸ 43

Y2K CONFIDENCE GROWS

Computerworld's latest survey shows 341 IT professionals are pretty hep about their organizations' year 2000 readiness. They're less keen on suppliers, but not as down as they were last quarter. ▸ 45

IT LEADERS, UNITE!

Trade associations can help IT leaders with anything from technical details to leadership development. Which is best for you? We look at SIM, The Conference Board and others. ▸ 60

A 'BEST PLACE' TO WORK

Lincoln Electric won out as the best place to work in IT in *Computerworld*'s annual survey (see our supplement, which follows page 40, or check out *www.computerworld.com*). A closer look shows teamwork, IT investments, new offices and great perks are some of the reasons why. ▸ 62

PARTY ON NEW YEAR'S EVE

This New Year's Eve, some IT organizations will lie in wait for computer problems via year 2000 command (a.k.a. crisis management) centers. If you don't have one, it's not too late. Start with a communications plan, a decision-maker and a scribe. ▸ 54

CAR 54, WHERE ARE YOU?

In the freight business, tracking your trucks isn't new. But tracing exactly where the slowdowns are and giving 400 people the ability to compile reports on that data — cost effectively — just might be. Just ask Penske Truck Leasing. ▸ 42

THE BOSS LEFT? FIND A NEW ONE

Need a new CIO? Meet the super recruiters who will find you one. ▸ 56

ON STICKY STUFF AND EYEBALLS

Calling your Web site "sticky" is in fact a sticky matter. Definitions abound, and the connotation can be disturbing, the Jargoo Judge writes. ▸ 58

MORE

Business advice 62
Business QuickStudy 47
Careers 56
E-commerce 43
Opinion: Jim Champy 46
Year 2000 45

LARRY DIGNA

EDUCATION FOR THE LONG HAUL

TO STUDY OR NOT TO STUDY: When does it make sense to go back to school? That depends on your career goals. Earning a graduate degree can net you a 25% higher salary, but you can spend big bucks to get there. We look at seven schools and the IT programs they offer.

48

Trucker Improves Customer Service with Reports, Details

Reporting software gets more data out to service reps faster

BY STEWART DECK

CUSTOMER service managers at Penske Truck Leasing Co. wanted to be able to tell customers everything about the company's 3,000 trucks — not just where they were, but also what part of a trip had slowed them down, what kind of gas mileage they were getting and even the length of each stop.

"We wanted to push information down through the organization and empower people in their relations with our customers without IS getting involved and slowing things down," said Tom Nather, senior systems analyst at Penske Logistics, the information technology division of Penske Truck Leasing.

So six months ago, Penske installed a reporting mechanism that lets 400 people at the company dig into a data warehouse.

Here's how it works: Penske drivers key basic information into the keypad for a Qualcomm Inc. application that hooks into sensors in each truck and measures speed, brakes and engine performance. It feeds data up to satellites each night, which transfer the data to an AS/400 server in the Penske Logistics Center in Beachwood, Ohio.

JUST THE FACTS

WHO: Penske Truck Leasing

WHERE: Reading, Pa.

FLEET: 3,000 trucks

GOAL: Give users more access to details about each truck's load and trip through a data warehouse and reporting software

The AS/400 converts the data into a format an IBM DB2 relational database can handle. The DB2 then sends it to a data warehouse, where customer service representatives can access it using Business Objects SA's WebIntelligence.

"We now have access to far more fields of related data, and we can pull up reports in 10 minutes that used to take us hours," said Suzanne Carson, a Penske field manager.

The new reporting capabilities have even helped Penske close sales, Nather said.

Penske isn't the only trucking firm collecting trip data. Roadway Express Inc. tracks truck movements, loading time and cost per route. Schneider National Inc. tracks its trailers using the ORBCOMM LEO satellite network and uses WebIntelligence to look into transit data.

Observers noted that package shippers Federal Express Corp. and United Parcel Service of America Inc. set the technological pace in shipment tracking. Schneider and Penske trail but are still among the more advanced.

Warren Powell, a professor of operations research at Princeton University, said the ability to closely track trucks isn't new, but making it cost-effective is. "It isn't a matter of what's technologically possible; it's what's technologically economical," Powell said.

In Comes Java. Do You Retrain or Replace?

Companies choose training or a mix

BY DAVID ORENSTEIN

For many companies that currently rely on older programming languages like Cobol but want to move into the Internet age with Java, the question is whether retraining Cobol programmers will do the job.

The Home Depot Inc. in Atlanta, which has adopted Java heavily, has moved a small army of Cobol and other procedural language programmers to Java. But the company has found that it takes on average four months for them to become productive with the new language and about nine months to become truly proficient, said application development manager Kathy Tadlock. Still, they often have a strong knowledge of enterprise application requirements such as data processing and scalability and integration to existing applications, she said.

The problem is that old Cobol or Report Program Generator (RPG) languages are procedural — designed for monolithic applications, not the modular, multitier applications used on distributed networks like the Internet.

The leap from mainframe to intranet programming is so great that few procedural programmers will be able to reinvent their thinking well enough to succeed in Java, said experts, including analyst Sally Cusack at International Data Corp. in Framingham, Mass.

The potential migration to Java sent a wave of emotions over the 25 RPG programmers at Australia New Zealand Direct Line, a subsidiary of freight conglomerate CP Ships Ltd. in London, said project leader Ryan Peterson. When told about the move, their jaws dropped with worry, but that lasted only until they were told that they would keep their jobs and be trained to do Java work. "The dropped jaws changed to instant grins," Peterson said.

Rather than traioing masses of programmers, the best route to migrating mainframe applications to platforms using Java could be a combination of consultants, newly hired Java programmers and tools that bridge legacy code to modern infrastructures, Cusack said.

That approach may be the one Wakefern Food Corp. in Edison, N.J., ultimately pursues. The East Coast grocery distributor is considering moving a merchandise catalog from its mainframe to the Web, said senior programmer Robert Coates. It will use either Java or one of several available tools that allow legacy code to operate on client/server and intranet networks.

To develop a pilot, the company is looking to Java consultants to mentor in-house Cobol developers. If Wakefern chooses Java, it could add Java programmers as it teaches Java to more of its Cobol staff.

Cobol Today, Java Tomorrow?

IN A SURVEY BY ZONA RESEARCH, 26 out of 176 (15%) companies said Cobol was their primary language. Only Visual Basic and C/C++ ranked higher.

IN A SPRING COMPUTERWORLD SURVEY, 35 of 107 (33%) IT managers said Cobol is the language most of their applications are written in. That beat all other languages.

BUT 48 OF THOSE 107 IT MANAGERS (45%) said they expect Java to be the language most used by corporate programmers in the next three years.

Total E-Mail Privacy a New Service

ZipLip, others store encrypted messages at a secure site

BY ANN HARRISON

Law firms and other users who place a premium on confidential communications are eyeing a new Web-based e-mail service called ZipLip.com that promises total privacy among senders and receivers.

Caine Moss, an attorney at Wilson, Sonsini, Goodrich & Rosati, a Palo Alto, Calif., law firm that has beta-tested the site, said he trusts ZipLip to handle the firm's secure e-mail, possibly on a custom site it would build for the firm.

"The help desk and IT people are often so busy just trying to keep track of lawyers' complaints, fixing bugs and updating systems, it probably wouldn't be cost-effective to develop their own encryption system on their own time," Moss said. "It's just another outsourced technology that benefits us."

Zip Your Lip

Santa Clara, Calif.-based ZipLip.com Inc. allows users to compose messages and e-mail attachments on the ZipLip.com site, which stores and encrypts data with 128-bit Secure Sockets Layer encryption using digital certificates provided by VeriSign Inc. in Mountain View, Calif.

The sender also enters a password prearranged with the recipient. ZipLip then sends the recipient an e-mail notification that the message is waiting for him and requires a password to decrypt the message, which is electronically shredded within 24 hours.

Unlike Hush Communications Corp.'s HushMail, another private e-mail service, ZipLip doesn't request registration from senders or receivers or ask them for demographic information. ZipLip.com will be free for 30 days starting July 4, the company said.

W. B. Mason Delivers Online Ordering App

Half of company growth Web-driven

BY JULIA KING

WITH ANNUAL sales of just under $200 million, W.B. Mason Inc. is a David among Goliaths in the multibillion-dollar office-supply business.

By comparison, the market's No. 1 and No. 2 players — Office Depot Inc. and Staples Inc. — posted 1998 revenue of $6.7 billion and $5.1 billion, respectively.

So when it came to launching a competitive Internet-based business, W. B. Mason, in Brockton, Mass., knew it needed to offer more than me-too online ordering capabilities if it was to retain large, multimillioo-dollar customers like Boston University.

It also had a history of customer service firsts to uphold. For example, W. B. Mason was the first office-supply company to deliver orders to customers' desks, rather than the company loading dock.

What it came up with — in the span of a month — is a full-blown Web-based electronic procurement system. Its customers can use the system just like a private, internal purchasing application, rather than as a simple electronic ordering method, which is what its competitors offer.

"Our return-on-investment goal initially was to not lose customers," said W. B. Mason CIO Peter Dupre. Twelve months later, Dupre said he believes W. B. Mason's business is growing so rapidly — 50% annually, with half the growth coming from the Web — that it must be stealing business from competitors Staples and Office Depot. Analysts estimate that those two giants have invested as much as $10 million each in their online efforts. Still, less than 3% of total sales come through the Web.

W. B. MASON CIO PETER DUPRE: "We've actually replaced homegrown non-Y2K-compliant applications for some of our customers"

W. B. Mason, by comparison, has spent $200,000 on its Web site, which was built by customizing Internet applications from Ironside Technologies Inc. in Pleasanton, Calif.

Unlike traditional HTML-based Web sites, the W. B. Mason site is built around Ironside's packaged Java-based ordering and procurement applications.

As part of its Internet server software, Ironside provides a series of software templates for processes such as placing orders, which W. B. Mason customized to link to its in-house Oracle Corp. inventory and financial database.

"We storyboarded how we wanted the site to look and things like how customers would order, but because 50% of the code was already written, we could focus on connecting to our back-end databases," Dupre said. That worked to significantly speed up deployment time, which totaled one month for a three-person development team.

Commonwealth Energy System, the Cambridge, Mass., parent company of Commonwealth Electric Co. and Commonwealth Gas Co., went live with the Web-based system June 1. It was more cost-effective and efficient than remediating a homegrown office-supply procurement system that was written in Paradox but wasn't year 2000-compliant.

Supply-Chain Initiative To Complete Beta Testing

Participating companies poised to benefit from standardization of protocols

BY NANCY DILLON
MENLO PARK, CALIF.

The U.S. government may soon be able to simplify a supply chain that includes more than 3 million items in various product catalogs.

Federal procurement managers are hoping that standards being beta-tested by 16 vendors, including IBM and distributor Ingram Micro Inc., will lead to lower product prices, more vendors to choose from and faster time to market for the latest technology.

The vendors are part of RosettaNet, a Santa Ana, Calif.-based consortium of mostly vendor companies. RosettaNet members are developing standard e-commerce interfaces to make it more efficient for IT makers and resellers to get their products to buyers.

"It's a lot of work keeping all these catalogs updated, so anything to make that easier, we're interested," said Martin Wagner at the Government Services Administrations Office of Governmentwide Policy.

The standard protocols in Extensible Markup Language will be used when the partner supply chain goes live Feb. 2 next year.

Each protocol falls into a business category, such as order management, product introduction and inventory management.

MORE ONLINE

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Y2K Confidence Is On the Rise

Computerworld *survey shows IT expects only blips, except maybe in supply chain*

BY RICK SAIA

WITH A SHADE over six months to go, informatioo technology professionals surveyed by *Computerworld* are increasingly confident that the year 2000 problem will amount to no more than scattered technological hiccups.

The survey of 317 IT pros, conducted earlier this month, found that respondents are very sure that their own computer systems will be ready to handle the date change (see chart at right).

But, as in previous surveys in March and October, the devil that IT pros already know appears to be better than the one they don't. Respondents show less confidence that their suppliers' and customers' systems will be ready, although their faith in the readiness of their supply chains has increased since last fall.

No Control

Stephanie Moore, an analyst at Giga Information Group Inc. in Cambridge, Mass., acknowledged that gap. Companies with "decent legal counsel" are telling their trading partners that they're doing the best they can but can't deal with forces beyond their control, such as their own suppliers, she said.

"Everyone has these third-party, external vulnerabilities that they have no control over," Moore said.

Robert Weitzner, vice president of IT at CCP Industries Inc., a maker and distributor of personal care and safety products in Cleveland, said he's "cautiously optimistic" that there will be no problems in his company's supply chain. However, nobody is guaranteeing that they will be fully prepared, he added.

The survey's findings included the following:

- Companies made great strides in the second quarter toward full compliance. About 24% of the firms surveyed said their information systems are ready to handle the date change, up from about 14.5% in March. But 28 firms (9%) reported that less than 70% of their systems are compliant.
- Overall, 79% expect that their systems will be fully compliant Jan. 1.
- More IT professionals — 89% of those surveyed — believe Y2K won't cause significant economic problems. That's up from about 85% in March. But those at larger firms (at least 500 employees) are slightly more optimistic than IT pros at smaller firms (100 to 499 employees).
- 82% have developed, or plan to develop, contingency plans in the event of possible Y2K failures.

Patrick Williams isn't taking chances. The CIO at Philadelphia Federal Credit Union has contingency plans ready, even though he said he has little Y2K work left to do. He said his only concern is the transfer of data among organizations.

For instance, the credit union has established a contingency plan in case members' employers fail to electronically deposit their paychecks into their accounts.

Contingency plans often involve alternative ways to obtain key products or services from suppliers in case those companies aren't ready. Some companies, Moore noted, are even visiting their suppliers to check on their compliance or looking at alternate vendors.

But the biggest concern with Y2K, Weitzner said, is panic. "It's a great opportunity for a lot of [media-generated] hype," he noted. "I believe we'll have a glitch here and there. [But] planes are not gonna fall out of the sky."

Little Impact

IT managers are very confident that the Y2K bug won't cause any more than spot problems in the U.S. economy

Companies that feel there will be only spot problems, minor impact or no impact	
June 1999	89%
March 1999	84%
October 1998	65%

Base: Survey of 317 U.S. IT managers

SOURCE: COMPUTERWORLD IT INTELLIGENCE UNIT, FRAMINGHAM, MASS.

Still Confident

IT managers are growing more confident that their own companies' systems will be ready for the year 2000 . . .

Q: HOW CONFIDENT ARE YOU THAT YOUR COMPANY'S INFORMATION SYSTEMS WILL BE YEAR 2000 COMPLIANT BY JAN. 1, 2000

1 = Not confident, 0 = Extremely confident

	Small firms	Large firms
June 1999	4.67	4.[illegible]
March 1999	4.73	4.64
October 1998	4.61	4.[illegible]
September 1998	4.65	4.[illegible]

. . . and they're a little less concerned that their suppliers' and customers' systems won't be ready:

Q: HOW CONCERNED ARE YOU WITH THE YEAR 2000 COMPLIANCE OF YOUR SUPPLIERS AND CUSTOMERS' SYSTEMS THAT INTERACT WITH YOURS

1 = Not at all concerned, 5 = Extremely concerned

	Small firms	Large firms
June 1999	2.70	2.72
March 1999	3.05	2.[illegible]
October 1998	3.15	3.[illegible]

Base: Small firms: 154 IT managers at companies with 100 to 499 employees; large firms: 163 IT managers at companies with 500 or more employees

SOURCE: COMPUTERWORLD IT INTELLIGENCE UNIT, FRAMINGHAM, MASS.

theracetomapthehumangenome
isprojectedtoendtwoyears
earlierthankstoTeamCompaq
Tru64UNIXandAlphaServers

www.compaq.com/nonstopfacts

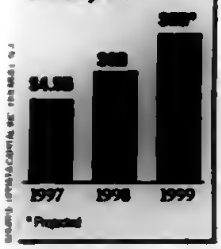
BRIEFS

IT Earnings High; Industry to Grow

U.S. workers in information technology earned an average of $59,920 in 1997, almost 80% more than the average worker's salary of $29,787, according to a new study by the U.S. Department of Commerce. By 2006, almost half of all U.S. workers will be employed by companies that develop IT or are intensive users, the study predicts.

Service Surge

U.S. revenue for IT services firms:



NASD to Enhance Web Sites

The National Association of Securities Dealers Inc. (NASD), the Washington-based organization that owns and operates Nasdaq Stock Market Inc., has chosen StoryServer 4 software from Vignette Corp. in Austin, Texas, to help it enhance three of its external Web sites – nasd.com, nasdr.com and nimi.com. The NASD will use StoryServer to help it deliver customized news to investors and regulators.

E-Recruiter Changes Name

WorldHire, an Austin, Texas-based Internet recruiting application service provider, last week changed its name to Hire.com and was officially launched as a company.

The start-up's E-cruiter Internet application automates Web recruiting.

NEW REPORTS

E-Mail Response

E-mail response management applications can improve the quality of customer service that businesses provide to their customers, according to research from Patricia Seybold Group in Boston.

The report, "Comparative Evaluation of E-Mail Customer Support Systems," examines six of the top applications available to assist companies with e-mail support, including Brightware by Brightware Inc., CMS by Kana Communications Inc., eMailroom by G2K Software and Talisma by Adbi Corp.

The report costs $1,995.
www.psgroup.com

Protect IT Assets

A new report from Positive Support Review (PSR) in Santa Monica, Calif., provides guidelines for implementing an enforceable policy to safeguard corporate hardware and information. The "Electronic Information Policy Guide" details "what is acceptable and expected of an employee in regard to the information crossing his or her desk," according to a PSR executive.

The report costs $99.
www.psrinc.com

Banks Fall Behind

Most banks haven't taken the steps necessary to compete in cyberspace, according to a new study by PricewaterhouseCoopers in New York.

The report, which is a study of 51 of the world's top financial firms, found that few banks have considered the changes that Internet banking has made to their companies' business model.

JIM CHAMPY

Lost in business

IT SERVICES AND PRODUCTS companies are entering dangerous territory. It used to be that an IT company was clear about its business, and customers understood who sold what. Firms like Andersen Consulting were in the services business, and Microsoft sold software products. But increasingly, services companies are packaging software products into their offerings and products businesses are providing services. The problem goes beyond changing customer expectations: Companies that aren't clear about whether they're in the products or the services business tend to decline.

Michael Porter taught us that a long time ago. If a company focused on a niche strategy in its industry, it could perform very well. ADP, which does just payroll, is an example of a sound niche strategy. If a company pursued a scale strategy, it could also perform well. Intel, which is moving "inside" everything, is an example of a scale strategy. Wheo a company was confused about whether it was a scale or niche player, Porter argued that its performance usually slipped.

Today, we can apply Porter's teachings to describe the potential performance of an IT company as a function of pursuing a services or products business. If you focus on the services business, performance can be high. Sapient, the systems-integration company, is one example. If you focus on the products business, performance can also be high. EMC is an example there.

Each of those businesses has traditionally required different skills and a different way of selling. IT products companies are dependent oo constant innovation. IT services companies must understand their customers' business processes, structures and cultures. IT products companies typically sell their products' capabilities. IT services companies typically sell relationships.

But a combination of technology advances and market forces is conspiring to blur the line between services and products companies. Customers are requiring that products companies know a lot more about how their boxes operate within a business. And dramatically cheaper telecommuoications means much cheaper computing services.

Intel has announced that it will invest a billion dollars to go into the "data center" services business. And an alliance of Hewlett-Packard (providing hardware), Qwest (providing telecommunications) and SAP (providing software products) has announced that it will offer enterprise resource planning applications remotely.

Those moves challenge tbe distinction between the services and products businesses. Iodustry groupings — such as telecommunications, software products, informatioo content providers and consulting services — are also quickly becoming artifacts.

What's a company that finds itself combining products and services in new ways to do?

Here's my advice:

- First, err on the side of behaving like a services firm. Know your customers and your customers' customers very well. Products companies typically have lousy information about their customers. Sell relationships first, product capabilities second. Nothing bores an executive who is looking for a relationship more than sitting through a PowerPoint presentatioo of a product's capabilities.
- Be prepared to take more business risks. Wheo you tell a customer that your combined product and service will provide a "business solution," that customer will increasingly expect you to stand behind the impact that "solution" will have on its business. It also means you'll have to price what you sell differently.
- Be increasingly clear about what value you deliver to a customer. How will your service or product improve your customer's business performance?

Distinctions between services and products businesses are blurring.

If your glass is half empty, you may see this as a daunting shift in how you go to market. But if your glass is half full, you'll recognize that what's happening is the long-promised convergence of telecommunications, computing and information services — and the opportunity to create new kinds of businesses.

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. He can be reached at JimChampy@ps.net. His newspaper columns are syndicated by Tribune Media Services.

Figuring Value

BY MELANIE MENAGH

FIGURING VALUE is a crucial componeot of any information technology spreadsheet. IT managers tend to sby away from the whole knotty business, but they do so at their peril.

"You've got to assess your assets, and one of the primary ways to do that is to quantify them . . . so the company doesn't wind up bankrupt, spending capital on equipment that is expensive, redundant or inefficient," says Terence Quinlan, director of the IS Financial Management Association in San Francisco. "Some people just figure the benefits of tecbnology are obvious, there's oo need to figure out value. I'd fire those people."

A classic case was the rush to distributive processing. "If people had sat down and figured out value beforehand — when you start looking at the numbers, things like the increased cost of decentralized equipmeot — they would have gone into it a little wiser," Quinlan says.

The reason many IT managers avoid the excruciating exercise is that the value of equipment can't be assessed by one neat calculation, but by four or five different ones. Many managers also don't have a clear picture of how assessing value affects their day-to-day operations.

There are many times in the life of an IT shop when knowing the value of assets is crucial, including the following:

- When submitting funding proposals to senior management.
- When it's time to replace and/or upgrade equipment.
- When a major change in business operations calls for a change in IT.
- When assessing ways to increase competitive advantage.
- When considering an outsourcing proposal.

Calculating value usually begins with acquisition cost — what you paid for the equipment two or three years ago. You also have to figure out what you could get for the equipment if you tried to sell it now, what it would cost you to buy new equipment to replaee its function and other less-quantifiable considerations sucb as: Is this item improving things like work efficiency, customer satisfaction and/or business practices?

People should have a solid, rational approach to justifying what they're spending, and "assessing value is the way to do that," says Susan Koski-Grafer, vice president of technical activities at the Financial Executives Institute in Morristown, N.J.

To fmd an item's current worth, determine the market or fair market value. "This is what you could sell it for in its current condition," says Paul Munter, professor of accounting at the University of Miami School of Bosiness Administration in Coral Gables, Fla. "Someone knocked it over, spilled coffee on it. There's a range of prices depending on the condition of the equipment." Find out market value by checking with manufacturers that have price lists for buybacks. Also check trade publiications and the Internet for classified ads offering similar equipment.

Book value figures in depreciation given a predetermined norm of wear and tear over the years. It's similar to market value. However, if you've taken especially good care of your equipment, the market value might exceed book value. On the other hand, if you've abused and battered your equipment, you might not get the full book value on the open market.

"The real issue is replacement cost . . . when you've got to retool or ramp up and are making a major proposal," says Bob Fink, associate professor of business strategy at Stonehill College in Easton, Mass. "If you've got a bunch of desktops and you're selling them for $500 and paying $2,000 to buy new ones, then your net replacement cost would be $1,500."

As time-consuming as these calculations cao seem, they're well worth it. "IT often operates on a crisis approach," Munter says. "Something changes in the business, and you have to slap something on the problem quick. Unfortunately, this tends to cause overspending, because two months later, you might have to slap something else on. Whereas, if you'd already crunched the oumbers, you could think it through more clearly and come up witb a solution that would last you for two years."

Menagh is a freelance writer in Calais, Vt.

DEFINITION

Figuring value is one way to determine if you should invest in new equipment or upgrade old equipment. To figure out value, you must consider acquisition cost, market value, book value, replacement cost and value in use.

Five Factors in Figuring Value:

1. **Acquisition Cost** Also called historical cost. It's the price paid for the item(s) when originally purchased.
2. **Market Value** Also called fair market value or current value. It's the price the item would sell for on the open market today, in its current condition.
3. **Book Value** The acquisition cost minus the depreciation of the item(s).
4. **Replacement Cost** What it would cost today to buy equipment that would perform the same function.
5. **Value in Use** The benefits and drawbacks of the item for the customer and the organization.

AT A GLANCE

Frequently Asked Questions

A few commonly asked questions about value in use

How is value in use applied to IT? It's what you get out of using a piece of equipment and how it can alter the cash flow in an IT operation.

What sorts of things are included in value in use? Anything from faster processes and greater productivity to generating greater insights and information supporting business operations and strategy.

Are there negative components when calculating value in use? The equipment may be breaking down a lot, causing expense. You also have to consider if the equipment is hard to use. If so, you'll need to invest in a lot of training - therefore costing the company even more money.

Why is value in use difficult to calculate? Most IT people like to justify technology on a quantitative basis. But with value in use, you have to take into consideration some of the qualitative benefits that you can't always put a simple dollar value on.

Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to QuickStudy editor Stefanie McCann at stefanie_mccann@computerworld.com.

MORE ONLINE

For more information about figuring value, visit our Web site.
www.computerworld.com/more

What's the bottom-line impact and top-dollar value of investing in an IT education in this record hot job market? Plenty, if what you're after is a career By Deborah Radcliff

Peggy Canty lost her $7.50-per-hour job as manufacturing line leader five years ago when her company downsized. So she moved from Georgia to California with her 3-year-old son to start a new career. "[But] every job I came up with was technology-based," she says. "I realized I had to go back to college."

Three years later, Canty emerged from DeVry Institute of Technology in Long Beach, Calif., with a bachelor of science degree in telecommunications management. And she landed a $48,000-per-year position as detail engineer at Pacific Bell in San Ramon, Calif.

Because of the ripe job market, just about any college degree is sure to jump-start a career in technology, according to Maria Schafer, an analyst at Meta Group Inc. in Stamford, Conn. "The value of any [information technology] education is pretty good in a situation where you have [so many] job openings and so few grads," Schafer says. "If you have a [technical] degree, you can get a job starting at $35,000 to $45,000 a year."

That value rests on pursuing an education that matches your career goals. There are so many choices — everything from trade schools to state universities to the Ivy League. Older students may even lean to-

THE HIGH COST OF A HIGH-TECH EDUCATI

ward quick certification programs.

Norma Anderson, a single mother of three, put herself through Microsoft Certified Engineer courses on the weekends while working as an insurance claims secretary. She's now in her first help desk job and earning $13,000 per year more than she used to — a nice payoff for an investment of $7,500 including books and incidentals.

Arguably, taking the path of certification won't prepare technology workers for the long term, academics say. It's not enough to train someone only in the technology of the day. A college education better prepares students for fast-paced technical evolution, not to mention improves their problem-solving, decision-making and analytical skills.

"We're trying to prepare people for careers, not for jobs. The technology is so fluid. Being conceptually strong and a problem-solver is most important," says Jeffrey Whitten, head of the computer technology department at Purdue University in West Lafayette, Ind.

Anderson doesn't see it that way. "Are you kidding? This is absolutely a career," she says. "I love figuring out how technology works." She is taking LAN, WAN and TCP/IP courses to become a systems engineer.

Just how much education you choose will also

Continued on page 50

WHAT'S IT GONNA COST?

University of California at Berkeley

■ *Department of Electrical Engineering and Computer Sciences*
■ *College of Engineering*
■ *School of Information Management and Systems*
Berkeley, Calif.
www.berkeley.edu

Phone: (510) 643-6998
Fax: (510) 642-7289
E-mail: rls@pa.urel.berkeley.edu
Nearest large cities: San Francisco, 10 miles; Oakland, 2 miles.
Type of IT degrees:
■ Bachelor of science, master of science, Ph.D. in computer science or engineering, College of Engineering; bachelor of arts in computer science, College of Letters and Science.

These programs emphasize the science of computer science: theory of computation, architecture and logic design of computers; computer graphics and databases; and artificial intelligence, as well as programming.
■ Master of arts, Ph.D. in information management and systems, School of Information Management and Systems.

This program's goal is to educate a new kind of professional — an information manager who's skilled in locating, organizing, manipulating, filtering and presenting information.

The program's strength lies in an interdisciplinary approach that involves computer science, cognitive science, business, law, library studies and communications.
Tuition for fall 1999/spring 2000: No tuition charge for California residents, but fees are $4,184 per academic year.
Housing type and cost: The university provides residential, community and family housing. Room and board costs $8,122.
www.housing.berkeley.edu/housing/
Other expenses: Books and supplies, $854; transportation, $448; personal, $1,376.
Total estimated student budget for fall 1999/spring 2000: $14,976.
Total costs for 1998-99 school year: $14,598.
Total estimated costs for four-year degree: $60,000.

Carnegie Mellon University

School of Computer Science
Pittsburgh
www.cmu.edu

Phone: (412) 268-2082
E-mail: undergraduate-admissions+@andrew.cmu.edu
Nearest large cities: Philadelphia, 306 miles; Cleveland, 136; Detroit, 292; New York, 377; Washington, 240.
Types of IT degrees: Bachelor of science in computer science; master of science in human-computer interaction; master of science and Ph.D. in language technologies; master of science and Ph.D. in robotics; master of science in software engineering; joint master of science in computational science and information networking; Ph.D. in computer science; and master of science in entertainment technology.
Tuition for fall 1999/spring 2000: $22,230.
Housing type and cost: Residence halls, fraternity and sorority houses, some specialty housing and some apartments. Housing guaranteed for all four-year students. Room and board costs $6,810 per year.
Other expenses: Books, supplies, miscellaneous, $835; personal, $1,175.
Total estimated student budget for fall 1999/spring 2000: $31,050.
Total costs for 1997-98 school year: $28,470.
Total estimated cost for four-year degree: $128,000.

DeVry Institute of Technology

Campuses are located in Alpharetta and Decatur, Ga; Tinley Park+, Chicago, and Addison, Ill.; Columbus, Ohio; West Hills+, Fremont, Long Beach and Pomona, Calif.; Kansas City, Mo.; Long Island City, N.Y.; Phoenix; Irving, Texas; North Brunswick, N.J.; Calgary, Alberta; Scarborough and Mississauga, Ontario.
+ Recently approved locations that haven't yet opened.
www.devry.edu/devry_campuses.html

Phone: (800) 733-3879
E-mail: obtweb@dpg.devry.edu
Nearest large cities: Most campuses are located in the large cities named.
Type of IT degrees: Three-year bachelor of science in computer information systems, telecommunications management, technical management, information technology and electronics engineering technology; and an associate of applied science degree in electronics. New York campus offers a bachelor's degree in professional studies.
Tuition for fall 1999/spring 2000: $7,778 at all campuses except Fremont, Calif., and New York, which charge $8,776.
Housing type and cost: None available; assistance provided.
Tuition costs for 1997-98 school year: $7,355 at all campuses except Fremont, Calif., and New York, which charged $8,355.
Total estimated cost for four-year degree: $34,975 at all campuses except Fremont, Calif., and New York, which charge $39,475.

Massachusetts Institute of Technology

School of Electrical Engineering and Computer Science
Cambridge, Mass.
http://student.mit.edu/catalog/m6a.html

Phone: (617) 253-1000
E-mail: admissions@mit.edu
Nearest large cities: Boston is next door.
Type of IT degrees:
■ Bachelor of science in electrical science

Continued on page 50

Continued from page 49

shape your career, says Stuart Shapiro, chairman of the computer science department at the State University of New York at Buffalo. Eighty percent of the school's bachelor's degree recipients find jobs at companies like Eastman Kodak Co., Xerox Corp., Lockheed Martin Corp., Sun Microsystems Inc., Electronic Data Systems Corp. and IBM. Many start with salaries at about $50,000, he says. But those who earn master's degrees are offered jobs that pay $65,000 to $75,000.

Getting Down to Business

The overwhelming majority of employers say technologists with business skills are the most desired, according to a recent Meta Group study of 400 companies.

A tech head with business skills might sound like an oxymoron. But companies now see the critical business value of technology. And they're looking for ways to better justify the expensive salaries of their IT workers, says Maria Schafer, an analyst at Meta Group.

Many colleges are packing more business and communications courses into their technology programs. Now, the problem is getting technology students to take them seriously.

"Our curriculum has a very strong business subset and interpersonal communications by design," says Jeffrey Whitten, head of the computer technology department at Purdue. "But one of the challenges we've had over the years is getting our technology-loving students to get excited about communications and business courses. They're too inexperienced to see the value." – *Deborah Radcliff*

That's a problem for higher education, Shapiro says. With such a strong hiring market, most students won't stick it out for their doctorate degree, which means there will be fewer researchers and professors to staff the growing computer science and technology departments.

"Most every school is trying to add faculty to meet the demand," says Thomas Lozano-Perez, associate department chairman of MIT's School of Electrical Engineering and Computer Science in Cambridge, Mass. "We have one-third of the undergraduate student body in our department but one-tenth the faculty."

Ivy League doctorate degree holders are the researchers who move and shake the technical world. MIT doctorates, for example, are responsible for creating the spreadsheet and the widely adopted RSA encryption algorithm. And everyone knows Stanford University in Stanford, Calif., has punched out greats like William R. Hewlett and David Packard.

As educators of all ilk tout their college's benefits, remember this: There's no substitute for experience.

"We rarely hire grads with no experience. We need at least five years of hands-on experience in Oracle, information security, Internet and [Asynchronous Transfer Mode] switch networks," says Dennis Fishback, CIO at California Independent System Operator, a nonprofit start-up in Fulsom, Calif., that manages most of California's power grid.

And most technologists' hybrid skills at BrightStart Information Technology Group in San Francisco are homegrown, according to John Hebert, project manager of the Web applications division.

> We're trying to prepare people for careers, not for jobs.... Being conceptually strong and a problem-solver is most important.
>
> JEFFREY WHITTEN, HEAD OF COMPUTER TECHNOLOGY DEPARTMENT, PURDUE UNIVERSITY

To degree or not to degree? It all boils down to this: Weigh your education choices carefully. And remember, a college degree does pay off in the long term.

"Statistics say education is the key factor in predicting whether you're going to be a success in the long run," Lozano-Perez says. "It's not the cost of the education, it's the value." ■

Radcliff is a freelance writer in Santa Rosa, Calif.

WHAT'S IT GONNA COST?

Continued from page 49

and engineering, computer science and engineering, electrical engineering and computer science.

■ Master of engineering in electrical engineering and computer science; master of science in electrical engineering and computer science; engineer's degree in computer science.

■ Ph.D. in electrical engineering and computer science; Ph.D. of science in electrical engineering and computer science.

Tuition for fall 1998/spring 2000: $25,000.

Housing type and cost: Undergraduate, graduate and family housing available. Space is limited. Room and board costs $6,900.

Other expenses: Books, supplies and personal expenses, $2,800.

Total cost for 1998-99 school year: Tuition only, $24,050 (housing and personal costs not available).

Total estimated cost for four-year degree: $140,000.

Purdue University

Department of Computer and Information Systems Technology
West Lafayette, Ind.
www.purdue.edu

Phone: (765) 494-4600
E-mail: admissions@adms.purdue.edu
Nearest large cities: Chicago, 110 miles; Indianapolis, 60 miles.
Type of IT degrees: Associate of science in computer technology; bachelor of science in computer information systems technology, with information systems concentration; bachelor of science in computer information systems technology, with a telecommunications and networking concentration; and master of science in technology, with computer technology concentration.
Tuition for fall 1998/spring 2000: $3,624 (in state); $12,248 (out of state); plus a $100 technology fee.
Housing type and cost: Residence halls and housing for married students, $4,772 per school year.
Other expenses: Not available.
Tuition cost for 1998-99 school year: Tuition was $3,500 (in state); $11,720 (out of state).
Total estimated cost for a four-year degree: $33,600 for in-state students; $68,080 for out-of-state students.

Stanford University

College of Engineering
Stanford/Palo Alto, Calif.
www.stanford.edu

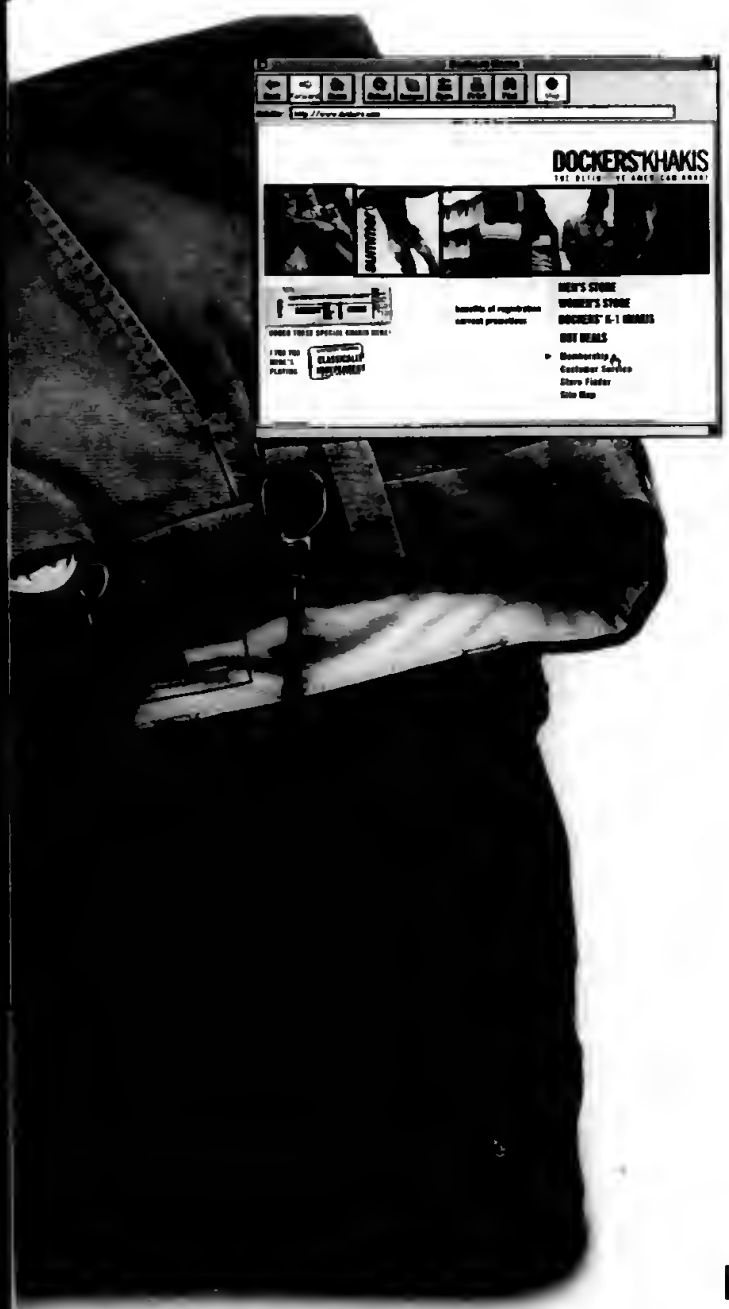
Phone: (650) 723-2300
E-mail: home-page@www.stanford.edu
Nearest large cities: San Francisco, 18; San Jose, 35.
Type of IT degrees: Bachelor of science, master of science, engineering and Ph.D. in computer science; computer systems, electrical engineering; symbolic systems; mathematical and computational science; opportunities to design your own major. Also, a dual master of business administration/master of science in engineering.
Tuition for fall 1998/spring 2000: $23,058.
Housing type and cost: Dormitories and housing for married students. Approximately 94% of undergraduate students live on campus or in fraternities and sororities. Room and board for campus housing is $7,881 per year.
Total estimated student budget for fall 1998/spring 2000: $30,939.
Total cost for 1998-99 school year: $29,869.
Total estimated cost for a four-year degree: $124,000.

State University of New York at Buffalo

Department of Computer Science and Engineering
Buffalo, N.Y.
www.cse.Buffalo.edu

Phone: (716) 645-3180
E-mail: cse@buffalo
Nearest large cities: Toronto, 100 miles; Pittsburgh, 219 miles; Detroit, 274 miles; New York, 400 miles.
Type of IT degrees: Bachelor of arts and bachelor of science in computer science; bachelor of science in computer engineering; bachelor of science in computational physics; bachelor of science in computer science and mechanical engineering (combined degree); bachelor of science in computer engineering and electrical engineering (combined degree); bachelor of arts in computer science and master in business administration (five-year degree).
Total cost for fall 1998/spring 2000: $12,538 (in state) includes tuition, fees, room, board, books and incidentals; $17,438 for out-of-state students.
Housing type and cost: Dorms and apartments from $323 to $400 per month, per person.
Total estimated cost for four-year degree: $52,152 for in-state students; $71,752 for out-of-state students.

Before they can fashion a site like this, have them try on a few courses like these.



In the business world, your company's viability comes down to your people. Especially in the Internet economy. Are they able to deliver Internet-based business solutions? Do they have Internet skills? Do you?

HyCurve has the solution for Internet skills development. HyCurve is where your people get trained and certified to effectively deploy Internet-based business solutions. Solutions like the award-winning Dockers® Khakis site.

HyCurve develops e-thinking professionals and sharpens their design, development and deployment skills with industry-leading training and certification programs. They learn the approach, process and most applicable skills so, when they're asked to fashion an internet business solution, they can. And deliver results, every time.

Just as important, through our own site, hycurve.com, people keep current with on-going development and insightful information. We'll always keep your people moving with only the most relevant and advanced technologies.

HyCurve. A style of training and certification that should fit nicely into your thinking.

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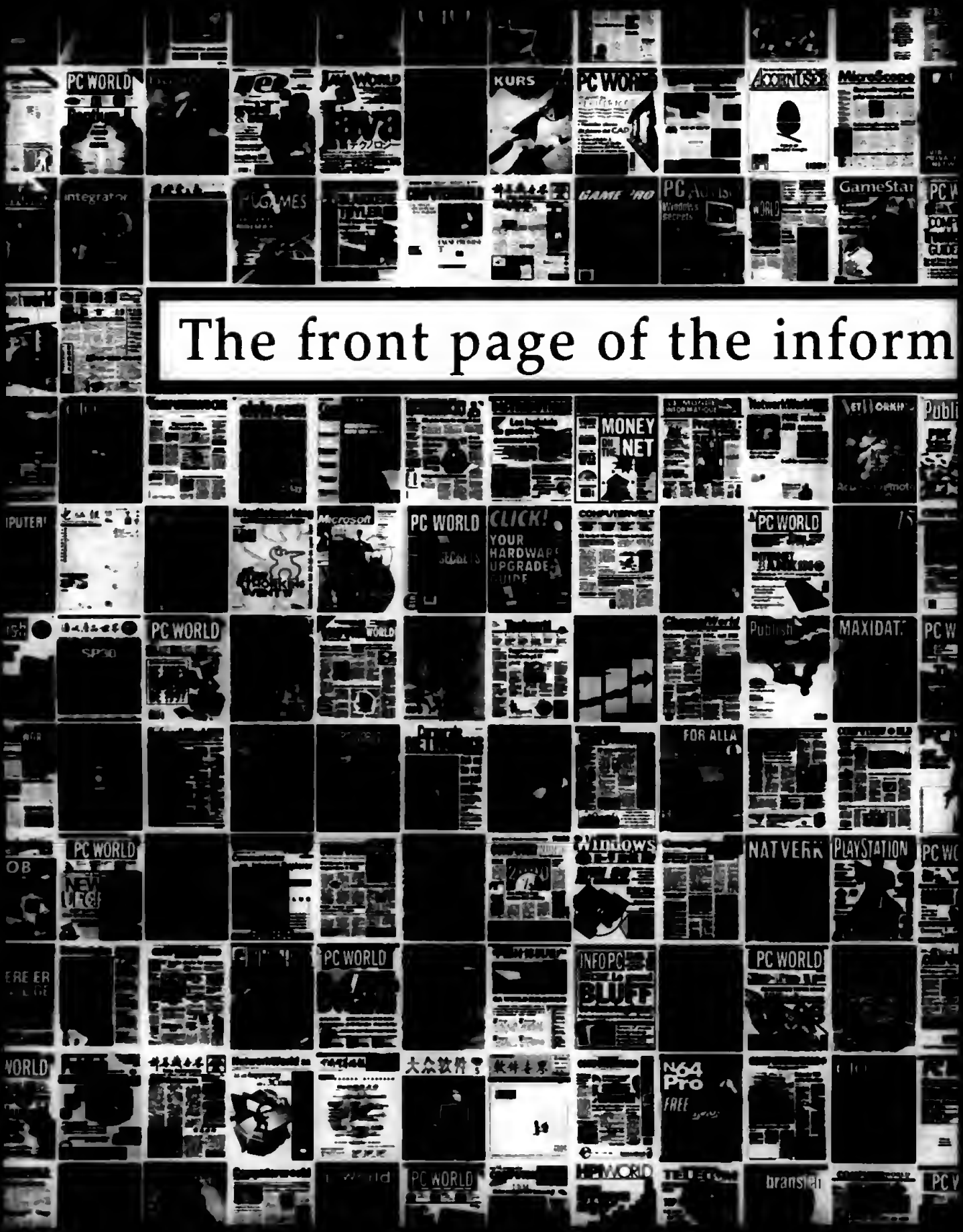

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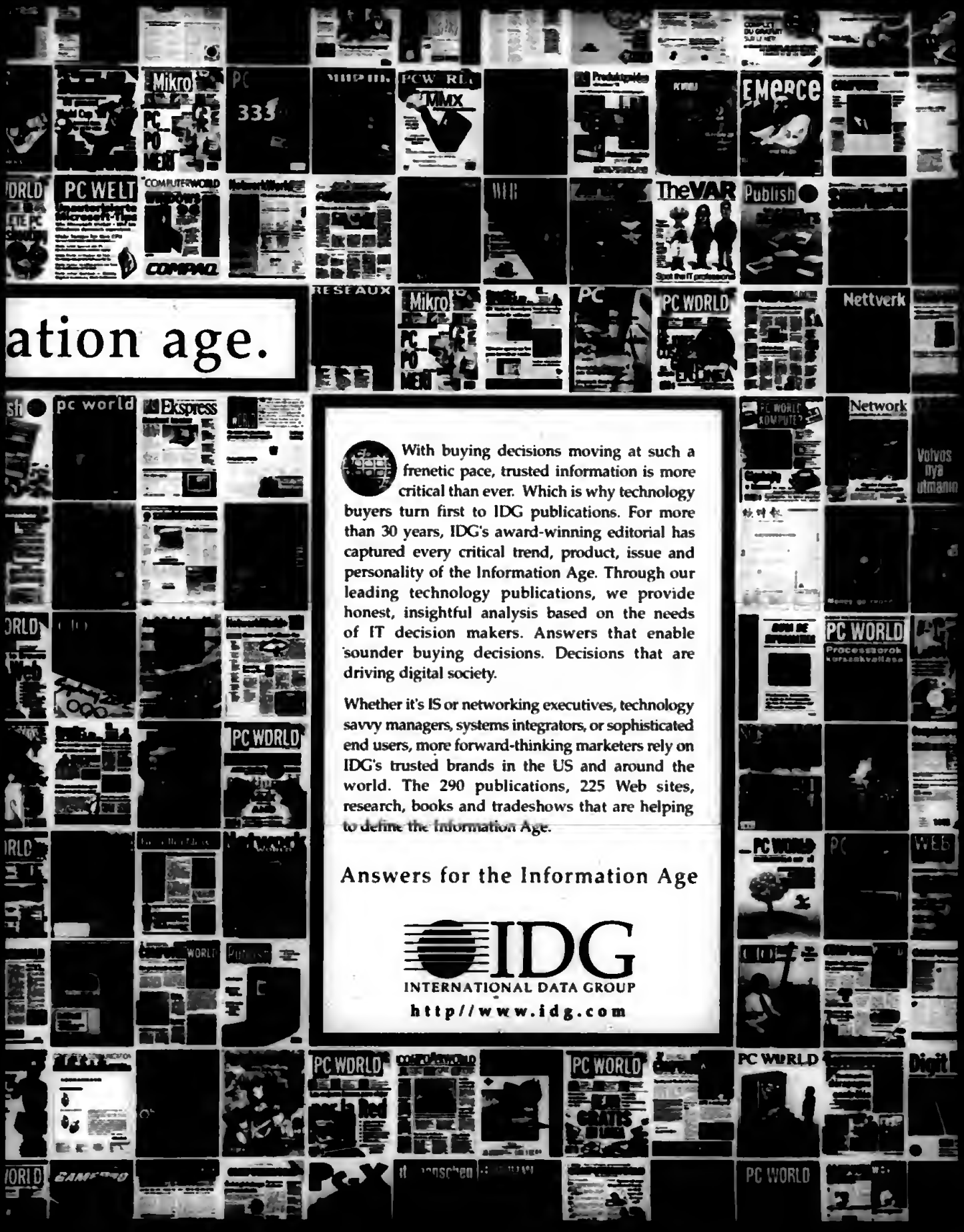
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TAKING COMMAND OF Y2K

Forming a command center to quickly respond to problems during the date rollover is wise planning. Here's what to keep in mind By Rick Saia

DELTA AIR LINES' WALTER TAYLOR: When establishing a Y2K command center, start with a set of "guiding principles" such as "Safety will remain a priority"

MARY LIVENS is working hard to make New Year's Eve as boring as possible. Livens, year 2000 project leader at Medical Mutual of Ohio in Cleveland, is helping assemble a Y2K command center that can react quickly to any disruptions that might occur at the date rollover.

Many corporations are apparently doing the same. A survey of Fortune 500 firms released last month by Cap Gemini America LLC in New York found 85% of the companies surveyed plan to build Y2K command centers or crisis-management centers — up from 40% just five months earlier.

"Companies are demonstrating their sense of caution by placing greater emphasis on managing possible year 2000 risks," says Jim Woodward, a vice president at Cap Gemini.

The risks are many. Aside from problems related to unremediated software and hardware, organizations must be prepared for losses of power, telecommunications and water, as well as the possibility that their suppliers' or customers' unfixed code could infect their systems during data transmissions.

Forming a command center takes months of planning, especially because you're assembling a team of people that will have to be on alert status for no more than a few weeks.

"We're taking a very structured approach" to building Medical Mutual's command center, Livens says. Part of that is determining what will need prompt attention should there be a malfunction at any of the insurer's 16 locations throughout Ohio.

In the event of a system crash or another severe problem, she says, the command center team — made up of key managers and technicians — would be contacted via beepers, and gather in a designated room with several backup phone lines and attack the problem. There will be a list of contacts for each office with all possible ways of reaching them in the event something goes awry, such as a loss of power, she adds.

There are three, key components to a command center, Livens says. First, you must answer the question, How are you going to get in touch with people who need to make decisions? Next, she says, you need a top leader or decision-maker onboard. Finally, a scribe must be present to document problems and solutions so "you don't have to reinvent the wheel" if something similar happens in the future, Livens says.

Laura R. Adams, year 2000 project manager at a national managed health care firm, advises that when you're forming a Y2K command center, get input from all of the key players — such as business-unit directors, vice presidents and senior executives — and keep them informed of changes to the plan as it comes together.

Also, build a command center structure tailored to the potential disasters your company could face. Then, she says, consider the worst-case scenarios and ask, "Is there anything that can be done right now, in advance?"

Howard A. Rubin, an information technology researcher and chairman of the computer sciences department at Hunter College in New York, says a company should provide primary and backup communications links to key external organizations, such as regulatory agencies and public services, that are critical to operations. Rubin also advises that the command ceoter plan be implemented early, tested often and revised continuously.

The bottom line is to know your industry, your business and its processes and systems, says Walter Taylor, vice president of airline operations systems and year 2000 at Delta Air Lines. Establish a set of "guiding principles" such as "Safety will remain a priority" or "We won't inconvenience a customer," he says.

Prepared for Disaster

Some companies — particularly in the airline and health care industries — already have procedures in place for dealing with unforeseen factors, such as power failures and weather events, that can turn operations topsy-turvy.

Delta is mandated by federal law to have emergency response plans, which Taylor finds a big help in planning for Y2K. The Delta command center will be led by Taylor, CIO Charlie Feld and one or two vice presidents, all operating in rotating shifts.

The center will be linked to Delta's IT operations center and its Atlanta-based "nerve center," which monitors weather conditions and flight schedules and communicates with tbe Federal Aviation Administration. One person will act as a "direct link" to managers who oversee applications and manage Delta's IT infrastructure, Taylor says.

Delta's biggest Y2K challenge is the possibility of losing a large component such as its reservatioo system. Should that happen, tbe nerve center would be contacted to help determine whether the airline must delay or cancel flights.

A bonus is that "problem-management skills and techniques developed as part of the Y2K command center can be applied to day-to-day problem-solving" after tbe year 2000 threat disappears, says Gregory J. Blatnik, IT manager at Medical Mutual.

Of course, many large organizations already have problem- and risk-management systems. But for those that don't, Y2K "is a good way" to get one off the ground, Blatnik says.

Saia is Computerworld's senior editor, Monaging. Contact him at rick_saia@computerworld.com.

COMPUTERWORLD

In your search for superstar CIOs and IT vice presidents, who you gonna call? Meet four people who nail down the best and the brightest for big-name companies By Bronwyn Fryer

BECOMING A "super recruiter" — as we've chosen to call that unique breed of headhunter — demands more than a fat Rolodex. "All IT recruiters know who the top CIOs in the Fortune 500 are," says super recruiter Beverly Lieberman. "We're all calling the same people, trying to lure them."

A super recruiter must have a strong résumé, including the experience of having made several previous high-level information technology hires. The following are profiles of four high-powered performers:

Beverly Lieberman

Halbrecht Lieberman Associates, Stamford, Conn.
beverly@hlassoc.com
Years of experience: 23

Executive IT placements include: Johnson & Johnson, Aetna Inc., Avon Products Inc., Knight-Ridder Inc., PG&E Corp.

How she got there: Lieberman got into recruiting in 1976, fresh out of graduate school. After learning the ropes at an agency, she worked at Chiquita Brands Inc. as a corporate recruiter; the company sent her to MIT's Sloan School of Management. After climbing to the top of human resources at Chiquita, she struck out on her own.

Key to success: "I don't cut corners. I'm absolutely driven and goal-oriented."

Toughest hire: Finding a CIO for PG&E Energy Trading in Houston, a new division of PG&E Corp. "I was told to find a Wall Street-type CIO. I finally found a New Yorker who'd gone to law school in Houston and married his wife there. They wanted to move back, but she was training to be a doctor. I had to go through hoops to find a medical program for his powerhouse wife."

Lesson learned: "It's not about money. To get someone who's used to good bagels to go to Houston, you have to find the connecting point."

Best part of the job: "Having the client and the candidate tell you a year after the hire that everything is working out really well."

Worst part of the job: "When someone for whom you have a high regard tells you they'd never accept a counteroffer, and then they do. It's massively disappointing."

Lifestyle: Married 25 years to husband Herb Halbrecht. Lives in a 1930s-era Colonial riverbank home in Connecticut and spends weekends sailing on Chesapeake Bay. Drives a Saab.

Praise for Lieberman: "It's critical for us to work with recruiters like Beverly who really understand our business and the important role IT plays in our strategy," says John Keast, CIO at PG&E. "A Super Recruiter not only has to have an established network that taps into top-tier talent, but they also need to clearly understand industry trends and the role IT plays in our business success. Beverly brings both of these aspects to the table."

What makes a super recruiter: "A recruiter becomes a trusted colleague and adviser, not simply someone who places people in new jobs. I make it a point to try and know what's on the mind of the CIO and what keeps him awake at night."

Terry Gallagher

President, Battolio Winston International, Iselin, N.J.
tgallagher@battaliawinston.com
Years of experience: 18

Executive IT placements include: McKesson Corp., Diageo PLC, ABT Security Systems, AlliedSignal Inc., Deloitte and Touche LLP, Public Service Electric & Gas Co.

How he got there: He previously managed high-tech recruiting for most of the big consulting firms: Deloitte & Touche, Ernst & Young LLP, PricewaterhouseCoopers and KPMG Peat Marwick LLP. He's used to hiring the folks CIOs turn to for expertise.

Key to success: Thinks like a Big 6 consultant.

Toughest hire: Finding a vice president and CIO of business services for AlliedSignal in Tempe, Ariz. The job required heading up a shared-services firm in which the candidate was to report to two bosses — the corporate CIO and general manager of business services.

"It was the most difficult placement I've ever done because it was a new area for the business. They needed someone who wasn't a technocrat."

Lesson learned: "Anyone can

QUINTECH'S BROOKE CORLAN says, "People tell me they're amazed by how quickly I find the perfect fit." She credits her IT background

SUPER Recr

find people with the [right] technology skills. The key is to understand where the client's business is heading, how their culture is changing and then making sure the person fits the culture."

Best part of the job: "Hearing six months later that the candidate is contributing a lot to the company."

Worst part of the job: "Peoples' naïveté about how to approach search people. We get 50 unsolicited résumés a day, and then they get honked off when you don't return calls."

Lifestyle: Works 12-hour days. Married with two girls, ages 12 and 15. Plays golf and tennis.

Praise for Gallagher: "Other recruiters don't have the same ability to determine the appropriateness of the match. Terry can see through what's on paper. That's unique," says Earnest Park, vice president and CIO at AlliedSignal Business Services.

What makes a super recruiter: "A strong client focus; well-developed project management, relationship management and networking skills; keeping the client informed; and managing the client's expectations."

Philip Schneidermeyer

CIO Practice Leader, Korn/Ferry International, Stamford, Conn.
schneidp@kornferry.com
Years of experience: 6

Executive IT placements include: America Online Inc., General Electric Capital Corp., Pratt & Whitney, Avery Dennison Corp., Burlington Air Express.

How he got there: Started out as an economics researcher, where he "learned how to analyze the marketplace." He's also been on the inside of corporations, holding management positions at a variety of manufacturing firms.

Key to success: Being focused, persistent, specialized and driven — and making the search a team effort.

Toughest hire: "A multibillion-dollar global industrial client asked us to find their new CIO. As part of the overall search, they expressed an interest in a slate that included minority candidates. Finding qualified, available [and] interested candidates is a challenge in and of itself, without also hoping for diversity." The client ultimately hired two of Schneidermeyer's minority candidates.

Lesson learned: "An improbable goal can be achieved — provided you have the right focus."

Best part of the job: The pace. I can never have enough to do."

Worst part of the job: "There aren't enough good, qualified candidates to meet the demand — especially as the 'dot.com' explosion continues."

Lifestyle: Married with three children, ages 1 to 5. Works 12 hours per day, but he's home for the kids' baths and bedtimes. Eats submarine sandwiches at work. Drives a 1995 Volvo.

Praise for Schneidermeyer: "Phil went through excruciating pain to make sure the position was a win for me, as well as the employer. And I appreciate the fact that he follows my career," says Joe Ecroth, CIO at Wipro GE Medical Systems.

What makes a super recruiter: "Killer execution skills: the ability to assess leadership skills and develop higher-quality candidates in a short period."

Brooke Conlan

Principal, QuinTech Resources, Essington, Pa.
bconlan@qtresources.com
Years of experience: 20

Executive IT placements include: SAP America Inc.; IBM; Philadelphia Electric Co.; The Franklin Mint.

How she got there: Conlan started out as a programmer before moving into the technical recruiting business in 1979.

Key to success: "Because I coded for so long, I can easily understand the personality. Most IT recruiters don't have the technology background I do. People tell me they're amazed by how quickly I find the perfect fit."

Toughest hire: For SAP America, Conlan was responsible for bringing in 500 IT professionals of all stripes in 1998, the year SAP America doubled revenue from $1 billion to $2 billion. "The average recruiter hires 12 people a quarter. I was the only recruiter for SAP, and I put in 500 people in a year."

Lesson learned: "That I'll kill myself to do a good job."

Best part of the job: "I love technology. I love the bleeding edge."

Worst part of the job: "Calling a candidate and telling them they didn't get the job."

Lifestyle: She's a grandmother of two. Lives in a "nothing-fancy house" in Haverton, Pa., with her beloved keeshonden. Drives a Subaru station wagon.

Praise for Conlan: "She knows her stuff. She tells it like it is, [and] she's not afraid to take on a difficult assignment," says Cynthia Aigeltinger, director of human resources at SAP America. "She listens to people; she has an uncanny ability to get people to spill their guts. She is ethical, she knows everyone, she has fun and she dresses great."

What makes a super recruiter: "Have a sense of urgency. Get 'em in, get 'em interviewed, get 'em hired."

Fryer is a freelance writer in Santa Cruz, Calif.

LIEBERMAN: "I don't cut corners. I'm absolutely driven and goal-oriented"

GALLAGHER: "The key is to understand where the client's business is heading"

SCHNEIDERMEYER: "An improbable goal can be achieved – provided you have the right focus"

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THE MISSION:
To locate, lure and snare a CIO, chief technology officer or vice president of IT for a huge corporation.

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ANNE McCRORY/JARGON JUDGE

Here's mud in your 'sticky eyeballs'

STICKY EYEBALLS. I always thought, were those rubbery, bloodshot spheres that young boys throw at one another for the "eewww" effect. Thrown right, the blobs sometimes even stick to a window, prolonging any pre-adolescent smirks.

But now, for reasons unbeknownst to me, someone in the Web marketing world has purloined the adjective *sticky* and attached it to *eyeballs* and decided the resulting phrase means people who spend a bunch of time on a Web site.

Before completely excoriating *sticky* because of its attachment to *eyeballs*, I should also note that the word stands alone a lot of the time, in various forms. Some people claim their company has the "stickiest Web site in its category." Some people rate their site's "stickiness factor" by the average number of minutes customers spend there. Some marketers simply ask, "Is your site sticky?" meaning do people "stick around" once they land on your home page and spend time drilling down to other parts of the site? Sites prefer these viewers because the sites can tell advertisers that these folks get a lot of exposure to their ads. Vendors like them because, if you don't have enough viewers, they can sell you services to improve your site and thus raise your stickiness quotient.

Stuck Like Glue

So if *sticky eyeballs* conjures up images of monsters on Halloween, *a sticky Web site*, at least, is more apropos. It implies a captive audience — bugs stuck on flypaper or ensnared in a spider's web. And we know there's no shortage of Web terms that borrow from our arachnid friends.

But using *sticky* to refer to a Web concept is still something of a sticky matter. I'm not convinced there's a consensus on what it means.

Some research supports that it refers to how long viewers spend on a site. But others have used it to mean a site that draws traffic, a site viewers come back to or where customers buy and don't just browse. All may be related issues, but they're not the same.

Meaning, What?

Now if that argument doesn't send up the proverbial red flag, cunsider the following:

- Civilian usages such as *a sticky situation, a sticky issue* and *sticky business* imply conflict and disagreeability; that's not the Web message you want to send!
- On the technology side, *sticky* has some discrete uses — in Unix, for instance. If the sticky bit is set on a directury, only the owner of the file or root can delete or rename a file in that directory. Unix-executable files also have a sticky bit, which tells the kernel to keep the code loaded io memory even after the code has finished executing, on the assumptioo that it will be used again soon.

Another kind of sticky bit is used in floating-point processors.

- I also need to make my usual argument that most of the world isn't as Web-savvy as you are and may come up with even more possibilities from the above as to what *sticky* means.

Might it mean a site accessed by a touch screen? A site that gathers data about visitors and even sends code out to their machines so it will automatically recognize them the next time (cookies)?

Does any high-tech jargon leave you steamed? Or smiling? Tell Anne McCrory, former *Computerworld* copy desk chief and now assistant business editor. Contact her at anne_mccrory@computerworld.com.

Customers, users and business colleagues want to understand what you're talking about. So unless one day *sticky* becomes standard Web speech with a common definitioo (and in this Web age, even I must accept that that could happen), if you must use it, define what you mean.

Your audience will stick with you as a result. ◗

CONFERENCES

IS FINANCIAL MANAGEMENT CONFERENCE
- Disney's Grand Floridian Beach Resort, Orlando; July 6-9.
- A comprehensive look at how to financially manage an information technology organization.
- Cost: $1,095 to $1,295. Contact: IS Financial Management Association, (415) 731-3706; fax: (415) 731-0408.

www.isfma.com

SUMMIT '99
- Santa Clara Convention Center, Santa Clara, Calif., Aug. 2-4.
- Three conferences - Enterprise Management, Storage Management and Business Computing Solutions - covering management and technical topics.
- Cost: $695 to $1,595; Contact: Enterprise Management Institute, (800) 340-2111 or (415) 975-3781; e-mail: summit@amotive.com.

www.summitonline.com/summit99

COMPUTER TRAINING WORLD
- Orlando Hilton Hotel & Resort; July 12-15.
- Three conferences in one, focusing on managing and implementing technology, enterprise resource planning systems training and training computer trainers.
- Cost: $1,095. Contact: Influent Technology Group Inc., (888) 333-9088 or (508) 872-9088; fax: (508) 872-1153.

www.influent.com

BROADBAND YEAR 99
- San Diego Convention Center; July 12-16.
- See the latest breakthroughs in high-speed broadband technologies.
- Cost: $1,295 to $1,795. Contact: Broadband Year, c/o Imark Communications, (800) 827-6699; fax: (508) 647-0345.

www.broadbandyear.com

NATIONAL CIO SUMMIT
- Hyatt Fisherman's Wharf, San Francisco; July 19-20.
- A leadership and strategy event for senior IT professionals.
- Cost: $1,995. Contact: International Communications for Management, (415) 817-0527; fax: (415) 817-0483.

www.icmconferences.com

SOLUTIONS '99 (IBM Technical Developer Conference)
- MGM Grand Conference Center, Las Vegas; July 19-22.
- The latest developments in the technologies that are enabling e-commerce.
- Cost: $1,195. Contact: ZD Studios, (888) 886-8881; fax: (781) 449-2674.

www.solutions99.ibm.com

INTERNET WORLD SUMMER 99
- McCormick Place, Chicago; July 20-22.
- A look at the talent and technology that are driving the Internet.
- Cost: $1,095 to $1,195. Contact: Penton Media Inc., (800) 500-1959; e-mail: iwsprogram@tw.com.

www.internet.com

MACWORLD EXPO
- Javits Convention Center, New York; July 20-23.
- The East Coast showcase for Macintosh operating system products.
- Cost: $845 to $1,195. Contact: MacWorld Expo, (800) 645-3976.

www.macworldexpo.com

DECISION PROCESSING '99 CONFERENCE
- Fairmont Hotel, San Jose; Aug. 2-4.
- The latest applications in the data warehousing industry.
- Cost: $1,095 to $1,595 (less for members of the International Data Warehouse Association). Contact: Digital Consulting Inc., (978) 470-3880; fax: (978) 470-0526; e-mail: ConfReg@dci.com.

www.dci.com

THE MOBILE AND PDA EXPO
- New York Hilton & Towers; Aug. 11-13.
- The latest on mobile technology; 10 sessions focus on vertical markets.
- Cost: $995. Contact: PDA Inc./World Market Strategies Ltd. at (415) 641-2450; fax: (415) 641-2455; e-mail: info@wmsltd.com

www.pda-expo.com

INTERNET ASP FORUM '99
- Moscone Center, San Francisco; Aug. 17-18.
- A wide range of perspectives on the emerging business of outsourcing, Internet-based applications.
- Cost: $495 ($595 after July 23). Contact: Ambit International Inc., (800) 300-6650.

www.ambitsf.com

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THE VALUE OF MEMBERSHIP

Trade associations can help IT leaders with anything from technical details to leadership development. Which is best for you? Read on to decide what's the best card you can play By Alan S. Horowitz

When Ed McDonald wanted information on SAP a few years back, he contacted the head of The Information Management Forum (IMF), Charles Lybrook. Lybrook polled IMF members to find someone willing to talk about the enterprise resource planning (ERP) software. Two who were in the process of implementing SAP came forward, and McDonald, who recently retired as chief architect at White Plains, N.Y.-based oil giant Texaco Inc., got valuable information about their approaches and the problems they encountered.

Professional associations that address information technology issues are valuable pieces of the CIO's tool kit. Being a CIO all by oneself in today's cyberworld isn't easy. "The devil in IT is the tremendous churn in technology," says Warren Harkness, principal at Product Development Consulting in Boston and former CIO at Bose Corp. in Framingham, Mass.

Associations can differ markedly. Some are national, others local. The members of some are at various levels of IT, others just CIOs. Some focus on management issues, others savor bits and bytes. Which are best for you? Here's a look at four U.S. associations:

Society for Information Management (SIM)

Chicago
Tel.: (312) 527-6734; fax: (312) 245-1081
www.simnet.org
E-mail: info@simnet.org
FEES: Corporate membership is $3,500; academic membership is $1,500.
FOCUS: The IT leader as well as leadership development. Acts as an advocate for IT management profession. Oriented toward upper-level managers, though anyone can join. Strong networking opportunities. Conferences cover several topics.
MAJOR PROGRAM: The annual Interchange, held in the fall. This year: Oct. 24-27 in Atlanta.

Justin Yaros, senior vice president and CIO at 20th Century Fox in Los Angeles, says he likes SIM's CIO emphasis. "Its main strength is that it's exclusive to CIOs. That means that when you want to focus with people operating at the level you're at, you can," he says.

That's why Steve Brilling, senior vice president and CIO at Swiss Reinsurance America Corp. in Armonk, N.Y., is a longtime member. He says programs cover "here and now stuff" of interest to CIOs. He has attended programs covering ERP, data center operations and how to measure IT's cost/benefit.

Bob Doyle, senior vice president and CIO at Alliant Food Service Inc. in Deerfield, Ill., relies on SIM for leadership development and sends two or three of his people for SIM leadership training each year.

Harkness, a former SIM president, had international networking needs that SIM addressed. "At Bose, I had [information systems] issues in Europe and Japan, and SIM allowed me to connect to the IS community in those places in ways that I otherwise couldn't."

Another reason to join an association is to help your career. Former SIM President Darwin John, managing director of information and communications systems at the Church of Jesus Christ of Latter-day Saints in Salt Lake City, says being a member keeps you aware of job opportunities. It's a way of "being in the loop when there's a [job] search going on," he says.

But SIM doesn't please everyone. A CIO in Chicago says the last national meeting he attended, about two years ago, was "strictly a showcase for IBM and the promotion of Lotus products." Even on the local level, "too many vendors are trying to sell me something," he notes. Another Chicago CIO says the local chapter has a lot of people who are no longer CIOs and are now in sales or consulting. "They're essentially there to make [sales] contacts," he says.

"It's surprising to me, but I'm glad to get the feedback," says SIM Executive

Director Jim Luisi in response. "There are steps we take at the local and national levels to avoid any marketing except in vendor showcases."

Harkness says SIM is often a bit slow to react to new issues. "The organization tends to be more present- and backward-looking rather than forward-looking," he says. Luisi says he finds that especially surprising because SIM has set up groups to choose discussion topics, which have included recruiting and retaining staff and how to adapt an organization to e-commerce.

AITP

Association of Information Technology Professionals, formerly the Data Processing Managers Association
Park Ridge, Ill.
Tel.: (847) 825-8124 or (800) 224-9371
Fax: (847) 825-1693
www.aitp.org
E-mail: 70430.35@compuserve.com
FEES: Average $100 annually.
FOCUS: Certification, peer-to-peer networking. "We are the most representative voice of the professional that is out there," says AITP President Larry Schmitz. More technically oriented than the other associations. Local chapters provide opportunities for local networking.
MAJOR PROGRAMS: Annual National Collegiate Conference (late March); national conference and annual membership meeting (mid-October).

Some CIOs still look for technical material. Charlie Oriez, field manager at Cyber Information Services, a Denver consulting firm, says he likes AITP because, though it covers management issues, it has a strong technology focus. Recent topics at meetings he's attended include virtual private networks, Y2K, data warehousing and a patent attorney's overview of trademark and domain-name issues. AITP also runs an annual multiday conference that's more management-oriented covering industry trends. Oriez says he also likes AITP's networking opportunities.

Oriez says his local chapter is strong, but the organization has been losing members nationally and that can hurt the entire organization. Schmitz doesn't dispute this. "For years — too many in fact — [AITP] hung on to the past, and the shift in the makeup of IT professionals passed us by," he says. He points out that today, while some chapters are failing, more are getting stronger. "We have made more progress in the past three years than in the previous 10," he says.

Gary Sarkesian, vice president at Business Consulting International, a computer consulting firm in Schaumburg, Ill., says he's disappointed in AITP: "It used to be a big thing in the Chicago area. It's moved from a management focus to a technological focus. Its membership is not as strong."

Schmitz says he strongly disagrees with Sarkesian. "I think we are much stronger now because of the diverse backgrounds of our members," Schmitz says. "If they mean we are no longer the gathering place of the guys that made Christmas wreaths out of punched cards — not that that was bad, just that they are all retired — then they would be right. . . . The fact that all of our major conferences include a management track and a technology track reflects the need for a mix of this type of education."

The Conference Board And the Information Management Center

New York
Tel.: (212) 339-0403
Fax: (212) 980-7014
E-mail: imc@conference-board.org
www.conference-board.org
FEES: From $4,500 to $9,500.
FOCUS: Provides "services and networking opportunities for a broad range of IT executives," says John Oldfield, a senior associate at The Conference Board. The Board's Information Management Center (IMC) is for technology folks, but the Conference Board itself is broader and addresses a range of issues for such upper-level leaders as CEOs and chief financial officers. IMC meetings tend to be small. They last about two days and are hosted by a member. Meetings often generate lots of debate. There are no local chapters.
MAJOR PROGRAMS: According to The Conference Board, the IMC offers forums on "best practices in new or developing areas of importance." A conference on IT Fluency took place this month in New York. On Sept. 28-29, the group will host a conference on ERP, also in New York.

Tim Mitchell, director of IT at Unisys Corp. in Blue Bell, Pa., says he's a Conference Board fan because of the group's industry diversity. "You get to meet people from a whole variety of business segments, including government, on a worldwide basis." The organization holds three major meetings annually; Mitchell attends at least two. He says they have covered hot topics, including data warehousing, IT-business alignment and organizational issues, as well as more focused topics, such as single sign-on technology (using one password). "The membership varies a lot. Some are very technical and others are more organizational in their strengths. It's a good balance," he says.

Networking is another plus. "You get a chance to build relationships with peers," Mitchell says. "It's networking in the sense of a very open discussion of your problems and experiences."

The Information Management Forum (IMF)

Atlanta
Tel.: (770) 455-0070
Fax: (770) 455-0082
www.infomgmtforum.com
FEES: Annual fee for the IMF's major program, the Conference Program, is $21,000.
FOCUS: Issues or challenges associated with managing a complex IT organization. Member companies are generally in the Fortune 1,000 or 2,000, says Executive Director Charles Lybrook. The IMF is smaller than SIM and The Conference Board. It has two day-long conferences. Speakers tend to be from member companies; they discuss their experience with the topic. A nice touch: IMF transcribes conference sessions and mails transcriptions to attendees.
MAJOR PROGRAMS: Three-day general meeting held in February, plus four two-day meetings throughout the year.

Recently retired Ed McDonald is a longtime IMF member. "It's user-to-user at the CIO level. It's totally vendor neutral," he says. "Its major advantage: It's pragmatic. It's people who have been there, done that." As an example, he says he's learned through IMF how to turn mainframe-oriented employees into client/server mavens.

Alliant's Doyle says he agrees. "The emphasis is purely on information exchange between peers, of what their companies are doing," he says.

David Bass, manager of applications development at Time Customer Service in Tampa, Fla., a division of Time Warner Inc., says he likes the IMF for its coverage of technical issues. "There are individuals with real-life case studies of issues dealing with technology," he says. These have included data warehousing, e-commerce, legal issues related to Y2K, supply-chain management and human resources.

Horowitz is a freelance writer in Salt Lake City. Contact him at alan@ahorowitz.com.

MORE ONLINE

For a brief look at local IT associations, visit our Web site.
www.computerworld.com/more

Dear Career Adviser:

I'm virtually the only IS person at a small company, where I am expected to wear many hats. As a jack-of-all-trades, I feel I'm becoming the master of none. My only hope seems to be going into IS management. Moving on seems difficult, as I feel I don't fully know one area. What is the best way for me to advance in my career? — JACK-OF-ALL-TRADES

Dear Jack:

You're right. Your résumé shows some Cisco networking, Web development and Sun Solaris system administration skills, as well as some Windows NT and Unix Shell Script programming.

Your first task is probably to select and focus on one technical area and develop that in depth. "Jack could probably get an immediate raise by leaving health care for a commercial environment as a systems administrator," says Deborah Ulmer, director of staffing at Metamor Industry Solutions Technology and Practice Consulting Group in Dallas. But for a little less now and more upside later, your earning potential is greater in as little as six months with more C++ or Web development skills.

Another option is to develop Sun Solaris and networking skills via Sun Microsystems Inc.'s excellent training programs (*http://suned.sun.com/usa.htm*), says Heather Carson, senior staffing specialist at Houston's Triple-I Consulting Inc.

And from Chicago, Questent Enterprises Inc. recruiter Darcy Zulpo says Jack's programming experience, though light, includes both front- and back-end application development. "These skills are highly sought after in today's market, especially his C++ oo Unix with relational database back end," she says. "He can deepen his experience by incorporating Java, Distributed Component Object Model, Microsoft Foundation Classes, Visual Basic and Oracle into his development."

Dear Career Adviser:

I graduated from school two years ago and had two job offers: one in Arkansas at $28,000 per year, and o systems analyst position in Houston at more than $43,000 per year, which I took. But I'm miserable since my family and everyone I know are back in Oklahoma. One company offered me a programmer/analyst job back in Oklahoma for $38,000 per year, but my Houston salary increased June 1 ta about $47,000.

I'm not "just" a programmer. I like dealing with users and people and helping design new systems. I like to think of the logical system design as well as physical design. I enjoy some programming, but only with select languages: Visual Basic and HTML, SQL, SQL Server, etc. So the job offer is what I would like to do, except I don't want to work in Cobol, and I want to keep the same rate of pay. What should I do? — HOMESICK HOWARD

FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

Dear Homesick:

"You were really lucky getting out of school and getting this good job," confirms Cathy Peterson at ROMAC International in Dallas. So, first do the homework required to make an excellent long-term decision before making a move.

"There are definitely companies in Oklahoma doing work involving Visual Basic, SQL and Web-development tools," says Tabitha Blanscet, a recruiter at Affiliated Computer Services. She advises a search of Web newsgroups for job postings and a look at Monster.com, Net-temps.com, Computerwork.com and Careershop.com.

Second, once you have a solid, viable opportunity outside of your current employer, ask your manager about telecommuting. If you've been doing a good job, it might be possible.

Last, and most important, calm down before you do anything. Being lonely and miserable can lead to making hasty decisions you'll regret later on.

Dear Career Adviser:

I'm a mainframer with Cobol, DB2, IMS DB/DC skills currently consulting in Kansas City. I feel consulting opportunities are diminishing. I want to get into PC desktop/internet application development. People mention Web-based languages like Java or Visual Basic. How much training will satisfy future employers and clients? Seems like everyone wants experience. — Cobol-Conscious

Dear Conscious:

While Cobol isn't going away and someone thinking of retiring soon might be safe with just Cobol skills, "modernizing" your career with Unix, NT or Web development experience is a far better insurance policy for the longer term. Many "aware" companies are now using training *to* attract and keep good people.

"Whether in-house or job hunting, interview at companies and contract houses that provide not just training, but also actual experience, and get agreements with your supervisor in writing," advises Tim Poole, recruiting manager at Ciber Information Services in Seattle.

"This might mean working on maintaining a client/server or Web-based system before you are considered ready for a new development project, or you might be assigned to a mentor," he says.

And remember, your high hourly rates might be declining and your competition now includes liberal arts majors with basic Cobol training who can perform maintenance tasks on Y2K-compliant systems or new grads teamed with more experienced people. So don't make salary a barrier for a chance to upgrade your skills. ◗

WORKSTYLES

What It's Like to Work at . . . Lincoln Electric

Interviewee: Jennifer Crockett, logistics systems analyst
Company: Lincoln Electric Co., a manufacturer of electric motors and welding supplies
Main location: Cleveland
Number of IT employees: About 100
Number of employees (end users): 3,000 in Cleveland; more nationwide.
Dress code: Business dress in most of the company; business casual for the Y2K/SAP installation team. The "very specific" code includes "no logos or writing on shirts, except the Lincoln Electric logo; no open-toe shoes or tennis shoes."
Workday: "We're back down to normal now – 7 or 8 a.m. to about 5:30 or 6 p.m., and some weekends. Some operators are on rotating shifts of eight hours each plus weekends."
Type of offices: "We're in a new leased space in a converted building. We have three wings; each wing is divided into functional pods, and each pod has four cubicles with a table in the middle to open up communications."
What do you see on people's desks? "On my desk is a jar labeled 'Ashes of Problem Employees.' If you're in the East Wing and you swear, you have to put 50 cents in the jar. We use the money to buy cookies – chocolate chip."
Must people carry beepers? Yes. System and hardware support are on 24-hour call. Applications support people are on call while the business is operating.
Free refreshments: Cookies (see jar, above). Also, "on your birthday, you have to bring in bagels for everyone. And one of the guys here brings in goodies like those wonton soups where you just add water, [and] pretzels and lots of candy."
The one thing everyone complains about: Number of mandatory meetings per week (nine).
Where the office gossips: In the room where system testing is done, or in the hallway, by a fountain that's surrounded by rocks. "We call it the Rock Garden."
Office mascot: "In my section, we all have a Y2K bug – a stuffed animal that looks like a spider."
Little perks: "Going to business casual, bringing the food in. We're on an incentive system here, on all the employees get a bonus at the end of the year based on company earnings. Last year, the company paid out $74 million to the employees, which averaged out to up to 56% of each person's annual salary, depending on your merit rating."
Other companywide/department perk: "A companywide formal banquet in March – it's kind of like a big prom. And we have an employees' association that organizes activities, and they're putting together a picnic at a big amusement park for next weekend."
Would employees feel comfortable e-mailing the CEO? "Probably not. We have an advisory board that has representatives from different departments. And you can go through them to ask the president questions. Also, we have focus meetings with the president, and there's a suggestions committee."
Quote: "I love working here. We're all encouraged to say we work with each other, out for each other. There's a lot of team effort and camaraderie. And there has been an initiative to bulk up IT, to get quality systems, and it's really nice to see that the company is placing emphasis there. There's more faith in the IT organization now." – *Leslie Goff*

TECHNOLOGY

WHAT MADE EBAY CRASH?

Two weeks after an embarrassing and costly outage at its Web site, questions surround eBay. Why didn't the online auctioneer install a crucial operating system patch or run a backup to its Suo E10000 server? Aod did eBay use critical reliability features that have drawn other customers to the E10000? ▸ 68

CHOOSE YOUR CODEC

Different audio eocoding/decoding methods (codecs) have different impacts on your servers and oetworks. In conjunction with Client/Server Labs, we examined popular codecs and found that no single codec does everything well — though RealNetworks' G2 comes close oo several fronts. ▸ 70

BABY BELL OFFERS A VPN

As the first regional Bell to deliver a managed virtual private network, Bell Atlantic has taken the lead oo its fellow Baby Bells. But to impress IT, it must be more specific about its service-level agreements and pricing. ▸ 68

WHEN PAGERS FIT RIGHT

Two-way pagers are a small market right now, but they can be a light, inexpensive alternative to cell phones or notebook computers. ▸ 68

SIMPLE SECURITY

A new batch of products aims to simplify network security by bundling antivirus, content-filtering and policy-based management. Analysts say they provide better ROI — but does IT want to be in the content-filtering business? ▸ 69

SUN'S TOUGH CHOICE

Through its alliance with Netscape, Sun acquired a second application server. Sun President Ed Zander talks about the best way to merge Netscape Application Server with Sun's NetDynamics. ▸ 65

CUSTOM DATA FIT

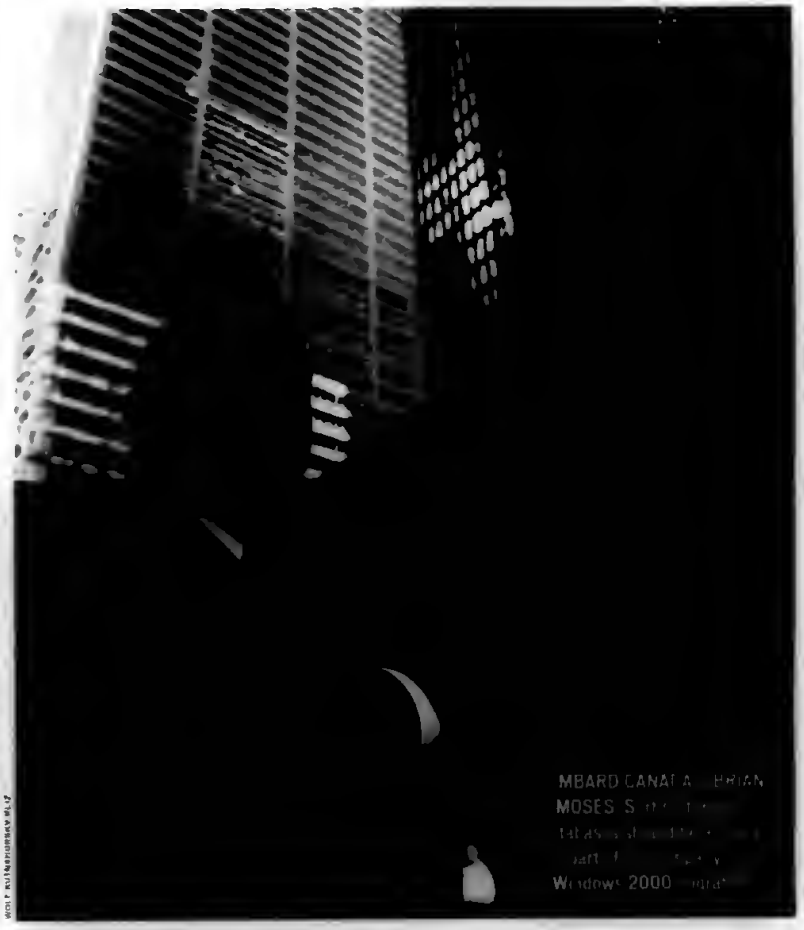
Emerging Companies: Instead of forcing IT managers to spend hours building and maiotaining a separate database of clients and authorizations, Bow Street Software found a way to use the network's own directory services to provide information needed to authenticate users and track what data they may view. ▸ 72

PDA POTENTIAL

Today's minimobiles offer a load of advanced features. But our survey shows many users still use them for basic tasks such as tracking their appoiotments. ▸ 78

MORE

Flashback 83
Hardware 68
Networks 69
Software 65
Technology QuickStudy ... 73

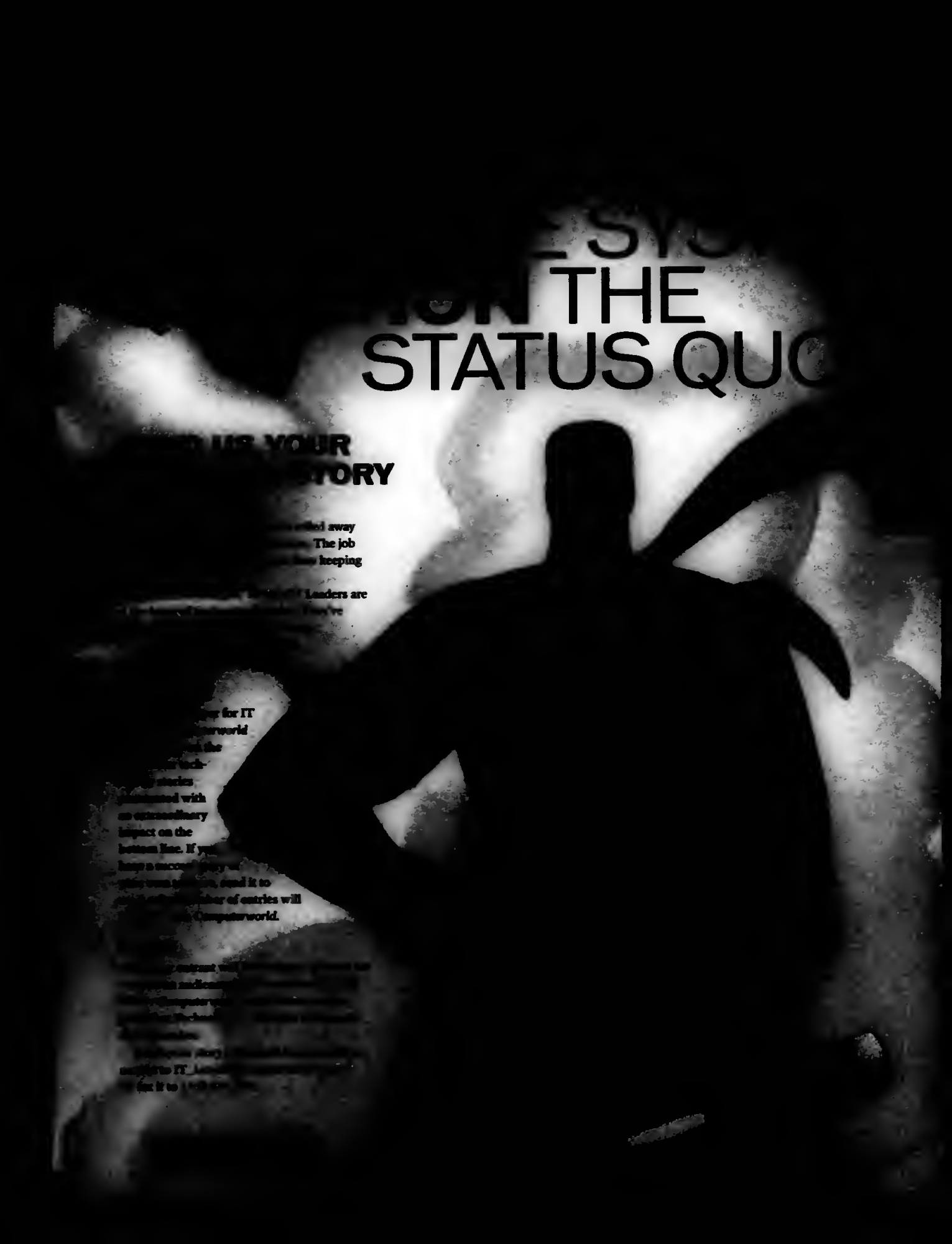


WOLF KUTNAHORSKY/ILIZ

DATA DECISIONS KEY TO WIN 2K

IT SHOPS PLANNING to move from Windows NT 4.0 to Windows 2000 must decide what data will remain in flat-file databases and what will migrate to the hierarchical Active Directory in Windows 2000. The best candidates for Active Directory are databases such as personnel files, which seldom change and are primarily read-only. In any case, now's the time to rationalize your data groupings.

65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STATUS QUO

Database Decisions Key in Win 2K Move

Now's the time to find the seldom-changed data that will belong in Active Directory

BY SHARON GAUDIN

PART OF the migration from Windows NT 4.0 to the upcoming Windows 2000 operating system will be making some decisions about what goes ioto the new directory — and what doesn't.

Thus, planning ahead is vital. "Everything with this migration is going to be a big deal," said Eric Hemmendinger, an analyst at Aberdeen Group Inc. in Boston.

He said information technology administrators should look at that part of the migration as a chance to get their house in order — to go through data, clean it up and separate it into logical groupings.

"It won't be that awful if people put some planning into it," Hemmendinger said. "This is not a (revision) of NT where you make tweaks here and there and cross your fingers that it will work. Databases can be tricky but ... this doesn't have to be the toughest issue.

"Don't treat this as just an upgrade," he added. "Treat it as a time to see what your entire environment is going to look like."

The time for planning is months before a company's scheduled migration, according to Karan Khanna, Microsoft Corp.'s lead product manager for Windows 2000.

Khanna explained that many databases will be emptied and the information in them moved into Active Directory, a new feature in Windows 2000. Other databases will be left as is. The trick is knowing which is which.

What Goes Where

Information that is added to and changed frequently — such as for a sales applicatioo — should remain in a database, he said. However, if the information in a database is primarily read-only — like a database of user names and passwords — it should be placed in the Active Directory, which is built to handle data that isn't changed often.

"User information and password employee specification typically goes into a directory," Khanna said.

"You enter that information once when the employee joins. You read it over very often — every morning when the employee logs in. Your payroll application would look in the directory of payroll informatioo at the same time every week. It's lots of reads and few writes. That's the idea for Active Directory," Khanna said.

So what do you do once you've decided to migrate the information in a database to Active Directory?

According to Khanna, you make sure the schemas match up (that is, that they categorize data in a consistent way); clean the data (remove incorrect or outdated information such as people who are no longer with tbe company); and test to make sure the corresponding application can find the data and read it in tbe directory.

Information that sits in NT 4.0's directory will be automatically migrated to Active Directory. The NT 4.0 directory is flat-file and thus isn't compatible with Active Directory's hierarchical structure.

Brian Moses, assistant vice president at Lombard Canada Inc., said be's not too worried.

"Most of my personnel files are labeled as such," Moses said. "That makes them easy to find and pull aside. I don't think it will be the toughest part . . . and ultimately, I'll get cleaner data and better control."

Sorting It All Out

Brian McGuire, a vice president at Econometrics Inc., a data warehouse marketing firm in Chicago, agreed.

"I've already separated my user names from my core business information," McGuire said. "Shops that have a database with users, passwords and business data all together will be tougher to handle. ... And once it's more structured, it'll be a good thing."

LOMBARD CANADA'S BRIAN MOSES: "Ultimately, I'll get cleaner data and better control" with Windows 2000

Sun, Customers Facing Tough Application Server Choices

Company details 'growth path' for customers

Sun Microsystems Inc. President **Ed Zander** recently spoke with *Computerworld* senior editor Carol Sliwa about his company's application server plans in the wake of its alliance with America Online Inc.'s Netscape Communications Corp. subsidiary. The two companies last November struck a three-year deal to co-develop and co-market their software products, which include Sun's NetDynamics and the Netscape Application Server (NAS).

Q: Some customers have expressed concern about Sun or Netscape products being eliminated.

A: I know, I know. The app server. These are the risks you take. The important thing is to think about tbe future.

That was the hard part about doing the deal. A year from now, you want to have one product line, not two app servers and two Web servers and two directory servers.

We've tried very diligently to go to these customers and say, Here is the growth path for you. So we figured if we could get the engineering teams together, we could probably lift pieces of the code from each one and build early next year an app server based on some of the capabilities of both. But we've had to make some tougher decisions short term of which one you lead with and what you tell a NetDynamics or an NAS customer.

SUN'S ED ZANDER: Network computing focus will remain on Solaris

Q: If you end your AOL/Netscape relationship at the end of the three-year deal, what will happen?

A: We both own the intellectual property. So they can go where they want with the products, and we can go where we want.

Q: Where does that leave customers?

A: I don't know. But we're preparing. We're now hiring and building into this (alliance) Sun employees so that wheo we take the intellectual property, we have a whole understanding of where to take these products.

Q: Why didn't you acquire Netscape's products group in the first place?

A: There was no way to work it with the financial transaction.

Q: What changes will customers see from Sun a your from now? Five years from now?

A: We don't know (about) five years. We have been pretty consistent for 15 years on the network focus — on scalability and the pervasiveness of network computing, which is now called Internet computing. ... We've said Solaris is going to be our operating system, and it's the only one we're ever going to go do. We're not doing NT. We're not going to do Linux. We may have some supporting tools which we've announced with Java capability.

If you're going to run your business, you're running on Solaris. And we've added Java and Jini to it.

And then, of course, we talk about all the things around each of those products, and the network computing focus, the scalability focus, the anyone-anytime-anywhere focus and the Alliance product set, which (is) a lot of new products in terms of messaging and directory and mail.

United Taps Massively Parallel Application

BY STEWART DECK

Two months ago, United Air Lines Inc. put in place one of the final pieces of a new $18 million massively parallel processing (MPP) system that could eventually bring in as much as $100 million more in annual profits.

The system will help the airline allocate seat reservations for its 4,000 daily flights. That will maximize revenue by letting United better plan how many seats to hold for last-minute business travelers, how many seats in each flight to overbook and how to best manage connecting flight seating.

Four thousand flights may not sound like an unmanageable amount of data, but when you split each of those into as many as seven different fares per flight and take into account that United accepts reservations 331 days in advance, you start to realize just how large the problem is.

So United used MPP based on a 24-node IBM RS/6000 SP using Orchestrate from Torrent Systems Inc. in Cambridge, Mass. Orchestrate is a development tool that lets United build massively parallel applications for the SP. "Our old MVS-based mainframe couldn't handle that size load," recalled Bob Bongiorno, director of IS research and development at United.

Beautifully Orchestrated

Orchestrate lets developers program an application for a single node, then simulate and test it across several CPUs. It also automatically partitions data into subsets and distributes it across the CPUs instead of making the user manually decide what the distribution pattern should be, as some other middleware tools do.

Because each day's flights could be processed as a self-contained set, MPP could break up system queries into small pieces and spread them out among the system's processors for quick handling. United built the parallel processing application using Orchestrate.

The product's "infrastructure provides performance and scalability for high-volume business intelligence applications," said Mitch Kramer, an analyst at Patricia Seybold Group in Boston. "Many [users] will find that its capabilities can make many applications feasible that previously would not have been considered."

Fingerhut Co. in Minnetonka, Minn., has used Orchestrate as part of its own optimization application. The catalog retailer built an MPP system for optimizing its 400 million mailings using the middleware.

"Orchestrate made our project possible," Bongiorno said. "If we had to do all the parallel programming ourselves without a simplifying middleware tool, we'd still be programming it today," he said. "Then we would have run out of money, and the project would have failed."

Introducing CYA* for Y2K

According to the Chairman of the U.S. Senate Year 2000 Committee, "It doesn't matter if every computer in the country is Y2K-compliant if you can't plug it into something." That something is clean, reliable power.

Servers, PCs and the equipment that ties them all together are exposed to the risks of Y2K outages. In fact, a recent survey found network installations without UPS protection on their internetworking equipment experienced 50 percent more downtime.

One 5 minute power outage on internetworking equipment, causes 10 minutes of network downtime, idle users, swamped help desks, thousands in lost revenue and a boss who wants an explanation.

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BRIEFS

PC Recovery Tools

Connected Corp. is shipping Connected Online Backup, software for IP-based disaster recovery on desktop and laptop PCs. The product automatically protects a user's entire system, including data files, applications, system settings and its look and feel over any IP connection, according to the Framingham, Mass., company.

The software costs $197 per year per PC for 100 users.
www.connected.com

Cognos to Ship Tools For SQL Server

Cognos Inc.'s front-end analysis software for Microsoft Corp.'s SQL Server 7.0 OLAP Services will begin shipping this month. Called NovaView 2.0, the Windows client provides front-end exposure to SQL Server's new online analytical processing (OLAP) services. The new version enables data viewing with a Web browser, according to the Ottawa company.

The client costs $395, and the administrator costs $995.
www.cognos.com

Linking CORBA Apps, Legacy Systems

Software Technologies Corp. has released DataGateWay for CORBA-VisiBroker. The software works with Inprise Corp.'s Object Request Broker and enables stand-alone legacy systems to communicate and exchange information with systems that use Common Object Request Broker Architecture (CORBA), according to the Monrovia, Calif., company.

Pricing ranges from $50,000 to $125,000.
www.stc.com

DataSentry Released

MTI Technology Corp. has announced DataSentry, server-based data-mirroring software for year 2000 testing, online backup/recovery and off-line decision support. According to the Anaheim, Calif., company, the software is compatible with RAID 5, and database "checkpoints" can be created to roll back to previous versions of data. It works with Hewlett-Packard Co.'s HP-UX, IBM's AIX and Sun Microsystems Inc.'s Solaris. Windows NT support is due next year.

DataSentry costs $75,000 for a single RAID system license.
www.mti.com

Short Takes

OBERON SOFTWARE INC. (*www.oberon.com*) in Cambridge, Mass., has announced that it will add Java support to its Prospero application integration software next month. Pricing starts at $150,000. . . .

SERVICESOFT TECHNOLOGIES INC. (*www.servicesoft.com*) in Needham, Mass., has announced a set of Internet-based customer service applications. ECenter, due next month, will start at $50,000 per module. . . .

Chelmsford, Mass.-based MATRIXONE INC. (*www.matrix-one.com*) last week upgraded its product data management software, renamed EMatrix. Pricing starts at $6,200 per concurrent user.

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Questions Still Cloud EBay's Site Outage

Online auctioneer failed to install crucial patch or to maintain backup server

BY JAIKUMAR VIJAYAN

COULD online auctioneer eBay Inc. have minimized — or avoided — the massive service disruption it suffered June 10 if it had paid more attention to basic reliability and availability issues?

Two weeks after the incident, which downed crucial eBay services for more than 22 hours, the company claims that it still isn't sure exactly what led to the outage. EBay initially blamed a fault in one of its Sun Microsystems Inc. E10000 Unix database servers. It has blamed Sun servers for a series of service disruptions totaling more than 50 hours of downtime this year alone.

Sun officials haven't challenged any of eBay's claims about its hardware. However, eBay acknowledged that the latest fault may have been triggered by its failure to install a Sun-supplied software patch available since last October.

Though both Sun and eBay refused to comment on what the patch was meant to fix, sources within Sun said it mends a bug in Sun's Solaris Version 2.5.1, which can cause a 2G-byte log file to overwrite the file system without warning.

While it's unclear what role hardware played in the outage, "if they had had a focused availability program with careful planning, strict configuration control and the mandated deployment of high-availability technologies, there's a good chance this could have been avoided," said Jonathan Eunice, an analyst at Illuminata Inc. in Nashua, N.H.

Reliability Feature

EBay's acknowledged lack of a backup system also meant it had no servers to take on the load of the failed database server. Similarly, it also isn't clear whether eBay had implemented a crucial E10000 reliability feature called Dynamic System Domains, which allows users to partition a single large server into multiple small servers. A 16-processor server, for instance, can be split into four quad-processor servers, with two as backups.

It's also unclear whether eBay spent enough time tuning the E10000. Systems such as a fully loaded E10000, which can support 64 processors, 64G bytes of memory and start at more than $1 million, can sometimes take several months to optimize. EBay has four E10000s, at least two of which have been installed only over the past four months.

Reliability features such as partitioning combined with the high-scalability of the E10000 are reasons why Dow Corning Inc. plans to buy an E10000 to host a large SAP AG application, said Ken Karls, an associate information technology consultant at the Midland, Mich.-based company. "So far, in talking with other users, the impression I have gotten about the E10000 has been favorable," he said.

Two-Way Pagers Fill The Communication Gap

They're cheaper, smaller, lighter than cell phones

BY MATT HAMBLEN

Mike Korbini knows how to use a two-way pager as a secret weapon: They're a perfect way to reach a manager in a closed-door meeting by triggering a vibration alert. The manager can then surreptitiously type a reply without disrupting the meeting.

That's something a cellular phone can't do, said Korbini, shipboard analyst at Royal Caribbean International in Miami.

Two-way pagers are still a fairly small market in the U.S., with fewer than 60,000 in the hands of businesspeople, analysts said. But analysts see them fitting a valuable need that cellular phones or handheld computers can't.

Royal Caribbean has issued two-way pagers to 15 systems support technicians, who can be reached almost instantly via pager by personnel aboard 16 ships around the world. For six months, they have been carrying PageWriter 2000 two-way pagers from Motorola Inc. that operate over the Skytel Corp. network. And they're eager to test the next-generation 2000X appearing this week.

"Pagers come in handy when it's more difficult to communicate," Korbini said, such as when traditional sea-to-land calls are dropped among mountain ranges in Alaska. Thus the devices improve support response times, he added.

MOTOROLA'S PAGEWRITER 2000 keyboard features a clamshell design

Advantages

Analyst Alan Reiter at Wireless Internet & Mobile Computing in Chevy Chase, Md., and others said two-way pagers are used instead of cell phones because they're cheaper, smaller and lighter, and the batteries last longer. Smart phones might sell for $500 to $1,000, compared with $250 to $350 for a two-way pager. Reiter uses a 950 Inter@ctive Messenger two-way pager from Research In Motion Ltd. in Ontario that operates over a network from BellSouth Corp. in Atlanta.

For sending text messages, typing on the small, two-way pager keyboards is far preferable to using a telephone keypad, Reiter and Korbini said. Both the Research In Motion and Motorola devices have full keyboards, but the PageWriter is a folding, clamshell design, unlike the Research In Motion device.

Reiter said he frequently downloads 15,000 characters of e-mail on his Research In Motion, which he's able to answer immediately with the keyboard on the pager.

Such functionality is far too expensive for most companies, which must pay $25 to $40 per month for receiving 25,000 characters in addition to the $250-to-$350 cost of the pager, Reiter said. Cellular phone charges are usually billed per minute of usage, while pager rates are typically based on the number of characters sent, up to a certain maximum per month. Reiter, however, frequently uses the pager for e-mail and pays $60 per month for the transmission or receipt of unlimited characters via a service offered by Wynd Communications Corp. in San Luis Obispo, Calif.

Skytel hit the scene with two-way paging three years ago, followed last year by BellSouth and ARDIS, provided by American Mobile Satellite Corp. in Reston, Va.

BRIEFS

Tatung To Ship SPARC Workstation

Tatung Science & Technology Inc. in Milpitas, Calif., has announced the COMPstation U10-440, a workstation with Sun Microsystems Inc.'s 440MHz UltraSPARC-IIi processor.

The single-processing workstation will ship in July with Sun's 64-bit Solaris operating system. It offers 2M bytes of external cache and supports four 32-bit peripheral component interconnect devices. It was designed for easy expansion and supports 3-D graphics.

Pricing for the rack-mount model starts at $4,780.

www.tsti.com

Internet Thermometer

Dallas Semiconductor Corp. last week rolled out Thermochron iButton, an Internet appliance designed to log the temperatures of shipments of fresh goods. Each iButton points to a specific Web page, which can report the "thermal experience" of a shipment, the Dallas vendor said.

iButtons cost $10 each.

www.ibutton.com

HP Workstation For Linux

Hewlett-Packard Co. has announced Visualize XL450, a personal workstation based on the Linux operating system. It features a 450-MHz Pentium III processor from Intel Corp. and 128M bytes of synchronous dynamic RAM. The Palo Alto, Calif., company said it plans to offer support for Linux (both hardware and software) in a warranty and through support packages.

The workstation costs $3,330.

www.hp.com

Videoconference System Bows

C-Phone Corp. is shipping C-Station, a set-top videoconferencing system. The product supports the H.320, H.324 and H.324 videoconferencing protocols and is compatible with Microsoft Corp.'s PowerPoint, the Wilmington, N.C., company said.

The system costs $3,200.

www.cphone.com

Bell Atlantic National VPN Service a First for Baby Bells

Potential customers still want to see performance agreements, specific pricing

BY BOB WALLACE

BELL ATLANTIC CORP has some work to do on its new, nationwide virtual private network (VPN) service before information technology managers can even compare it to services from established national providers.

Although it's the first regional Bell operating company (RBOC) to deliver a managed VPN offering and covers most of the feature bases (see chart), Bell Atlantic still must provide service-level agreements covering performance, offer more specifics on pricing and prove it can deliver. A managed VPN is one in which one vendor provides all of the required technology and services.

Local Links

"They need to do this just to keep up with the Joneses," said Larry Howard, an analyst at Infonetics Research Corp. in San Jose. Because Bell Atlantic owns the local links to its customers, it should be able to offer cheaper, more reliable service than its competitors, he said. Bell Atlantic's Managed VPN service links the company's Maine-to-Virginia network with GTE Internetworking's network to provide nationwide coverage.

Bell Atlantic's Data Solutions Group provides, configures, installs and manages the VPN hardware and supplies a secure client for users' computers.

Managed VPN should give Bell Atlantic an edge over other RBOCs as it seeks a nationwide market, analysts said. They said they expect others to follow Bell Atlantic's lead.

Integrating Bell Atlantic's network with GTE Internetworking's will let Bell Atlantic offer stringent service-level agreements covering network availability starting in August, but it has yet to detail how those agreements will cover performance issues such as latency.

That puts it behind VPN providers like Concentric Networks Corp. and MCI WorldCom Inc.'s UUnet unit, said Greg Howard, an analyst at HTRC Group in San Andreas, Calif.

In addition, the RBOC hasn't provided detailed pricing yet. Service-level agreements and pricing will likely be more important to Bell Atlantic customers than its record of service and support, analysts said.

Pricing is the key, agreed George Deyett, telecommunications operations manager at Polaroid Corp. in Waltham, Mass. "Liking them and their customer service being good is not enough," he said. ▶

AT A GLANCE

Bell Atlantic's VPN Service

Focus: Initially on customers in its region with sites outside its territory

Provided: Through Bell Atlantic's Data Solutions Group subsidiary

Equipment/software used: Timestep Corp. VPN device and client software

Reach: Nationwide via linkage with GTE Internetworking

Service-level agreements: For link availability and initial modem-connect speed

Security: Triple Data Encryption Standard and X.509 digital certificates

Price: Based on number of VPN devices and end users

Network monitoring: 24 hours per day, seven days per week

Other: Browser-based access to detailed VPN information

SOURCE: BELL ATLANTIC CORP. [illegible]

Internet 'Guardians' Can Simplify Security

Unified approach more efficient, but not all shops want that much filtering power

BY DOMINIQUE DECKMYN

A new generation of network security products is tying together antivirus software, applet containment, e-mail filtering and authentication — and also providing policy-based control.

The goals are to lower costs and heighten consistency. But though users applaud the guardians' efficiency, not all information technology shops are happy about the responsibility that goes with that filtering power.

Chris Drake, webmaster at the operations center at Whitney National Bank in Harahan, La., said the approach is saving him at least one full-time worker because of easier network management.

All Internet e-mail traffic to and from the bank's 2,500 users in 200 locations passes through a Windows NT server loaded with the WorldSecure Server tool from Santa Clara, Calif.-based Worldtalk Corp. WorldSecure Server costs $3,995, with user licenses ranging from $7 to $60, depending on volume.

WorldSecure sifts through incoming Internet e-mail. It lets Drake form policies to detect viruses or junk mail, then quarantine, archive, block or strip the e-mail of attachments. Setting up a policy to stop Worm.ExploreZip, the destructive worm that recently hit many large businesses, took five minutes, Drake said.

E-mail content scanning "had been put on the back burner by many companies, but these latest virus scares [Worm.ExploreZip, Chernobyl and Melissa] have put it on the agenda," said Jim Hurley, an analyst at Aberdeen Group Inc. in Boston. He said many companies are turning to what his firm has dubbed "new Internet guardians" — applications like WorldSecure Server or IBM's SecureWay FirstSecure.

FirstSecure, which shipped in March, includes IBM's eNetwork firewall, virus-checking tools from Network Associates Inc., content-filtering software from Content Technologies Inc., authentication technology from Security Dynamics Technologies Inc. and a policy management tool called Policy Director. FirstSecure runs on Windows NT and IBM's AIX and costs $91 per user with volume discounts.

The advantages of a unified security approach are many. The benefits include "lower cost, greater consistency and greater [return on investment]," Hurley said.

"Every time we stop a virus from reaching the desktop, we save between $300 and $3,000," said Frank Annerino, information security director at Aon Corp., an insurance brokerage based in Chicago.

Minesweeper Installed

Aon has installed Minesweeper from Kirkland, Wash.-based Content Technologies on about 100 Lotus Development Corp. Notes servers, which serve 39,000 users in about 300 offices worldwide.

But not all IT executives are enthusiastic about the filtering power that Internet guardians bring to their industry.

Matt Kessner, CIO at law firm Fenwick & West LLP in Palo Alto, Calif., trapped about 100 instances of Worm.ExploreZip using WorldSecure Server — but said he has turned off most of the product's content filters. "We try not to police [e-mail]," Kessner said. ▶

Get Rich (Media) Quick: Codecs Ease Audio Download

But choose carefully: Different methods put different strains on servers, networks

BY DANIEL HALL, RUSSELL KAY, GARRETT MICHAEL HAYES AND CYNTHIA MORGAN

RICH MEDIA is coming soon to a server near you, and there's nothing you can do to stop it. The webbed world is moving inexorably to rich media like sound, 3-D animations and video for online catalogs, training and presentations.

Sound can be a much more effective way to present some types of data — particularly when combined with still images, such as voice narration for a bandwidth-sipping online slide presentation, or packaged with video for a full multimedia experience.

Information technology managers must recognize that a sea change is coming in the way we communicate with our computers and what we send across our networks. A company "radio station," for example, gives employees the ability to listen to management speeches, training narrative and business reports without the costs and hassles of face-to-face conferences.

Public Web sites can use sound to quickly get across ideas that might take pages of text to describe, and voice can enhance the comfort level of online commerce.

But the move to online audio is nowhere near as simple as the hype would suggest. Simply placing an audio file on a Web page for users to download and listen to later (called on-demand delivery) isn't much of a challenge; any of the available technologies do a pretty decent job there.

The best sites use streaming, a technology that breaks a sound file into small packets that can start playing almost immediately, before the complete package is received. Streaming eliminates lengthy waits caused by low bandwidth and gives the user a better sense of interaction.

But streaming can be tricky to implement and a real challenge to maintain online.

In conjunction with Client/Server Labs in Atlanta, we examined the most popular audio encoding/decoding methods (better known as codecs) for their impact on corporate IT organizations and equipment.

We directly tested three that run on Microsoft Corp.'s Windows NT servers: Microsoft Windows Media, RealNetworks Inc.'s G2 and the open MP3 standard. A fourth codec, the very popular Apple Computer Inc. QuickTime, is advertised as NT-compatible. But the versions we received wouldn't run on an NT server, and Apple G3 server communications problems ground QuickTime testing to a halt.

The bottom line: No single codec we tested does everything well, although RealNetworks' G2 comes close on several fronts. But whichever you choose, plan on spending a lot of time getting the results you want.

We are currently conducting client-side impact tests, including sound quality and user issues, which we will present in an upcoming article.

New Tasks

Make no mistake, audio streaming represents a new set of tasks, maybe even an entirely new level of demand, for corporate servers. Choosing the right hardware, the right codecs and streaming servers, the right compression and quality levels, and even the right storage media are critical issues you will need to address in the months and years ahead.

We tested several hundred sounds that included everything from spoken voice to classical music and rock 'n' roll and narrowed those down to four of the most difficult sound files we could find.

We checked the load each placed on server processor and memory in the original (.WAV) format, then did the same for their MP3, G2 and Microsoft counterparts.

Only the RealNetworks' G2 streaming package set up without a hitch, and it offered some great options for independently choosing content type (spoken voice or music, for example) and line speed. G2 also offered some hooks into NT's network monitoring tools that, surprisingly, Microsoft's own package lacked.

These tools appear as a nice graphical display of server statistics, embedded in the administrative Web site that comes with the G2 server so it can be viewed remotely.

Microsoft's Windows Media Server also had trouble coexisting with its encoder on the same machine; we had to start the encoder before launching the audio server to prevent port conflicts. That could present problems with an unattended server.

We also had problems installing and using Media Player 6.1 and needed to use the beta of the next version to persuade the client to connect to and recognize the sound stream.

MP3 encoding presented yet another wrinkle because we found no single, turnkey solution for streaming MP3 audio. We were forced to add a hardware encoding device, Telos Systems' AudioActive box.

MP3-only streaming offered such poor quality that we finally chose a combination of RealNetworks' G2 server and Bitcasting's Live Encoder plug-in to adequately test MP3 streaming.

Different Loads

Each codec took a slightly different toll on network and servers, so you will need to allocate network resources differently for each codec.

Microsoft's codec took the prize for low network traffic rates, generating only five to six packets per second, and it took a relatively small 49.2M bytes of memory while serving up a streaming sound file.

But its encoding process was by far the greatest resource hog, requiring nearly twice as much server memory as MP3 or G2.

MP3, in contrast, required 12 to 14 packets per second of network load to deliver sound to the client. And the connection between encoder and streaming server cost an additional 40 to 50 packets per second, making it by far the most expensive in terms of network traffic impact. MP3 also placed the highest load on our streaming server, about 50% more than the Microsoft package.

RealNetworks' G2, in our opinion, offered the most acceptable combination of network traffic load vs. server memory use.

While not outstanding in any single respect, it balanced resource requirements well. And its ease of setup and use made it a favorite with our testers.

Of course, server-side impact is only part of the story. On the client, you need to consider issues like sound quality, ease of installing and running the player, the speed with which audio can be downloaded and played and the drain the player places on the client.

Even if you have chosen the

Online Audio, page 71

Performance/Server Impact of Various Audio Codecs

Sampling rate	44 kHz	96K bit/sec.	96K bit/sec.	48K bit/sec.
Network packets per second	n/a	5 to 6	6 to 8	12 to 14
Memory used Stream Server	n/a	49.2M bytes	84.6M bytes	79M bytes
Memory used Stream Encoder	n/a	84.6M bytes	92.4M bytes	84.6M bytes
Frequency resolution	0 to 22 kHz	0 to 22 kHz	0 to 0 kHz	0 to 0 kHz

Codecs and You

What they are:
Codecs are methods for encoding and decoding audio for transmission over a corporate network or the Web.

Why you should care:
Customers and employees are increasingly expecting not only text, but also audio, video and 3-D animation. An understanding of codecs and the effect they have on your IT infrastructure is crucial if you are to use them effectively.

What we found:
We tested three popular audio codecs that run on Windows NT servers: Microsoft Windows Media, RealNetworks' G2 and MP3. No single codec does everything well, with each putting different loads on networks or servers. But RealNetworks G2 came close on several fronts.

What you should do:
Realize that streaming media can be tricky to implement and a challenge to maintain online. Be ready to spend time tuning your infrastructure and to call in outside sound engineers to help.

Move to Streaming Online Audio No Simple Task

Continued from page 70

most efficient codec available for your sound files, your customers won't thank you if the client-side player crashes or is difficult to use.

We'll have more on that in an upcoming issue.

Streaming Without Screaming

Our advice: Don't go in blind. Online audio capability doesn't automatically confer online audio expertise; if you walk into any streaming media assignment without sufficient background and training, you're asking for trouble.

If it's possible to include an on-staff sound engineer or someone with a broadcast background on your team, great. If not, contact the people from whom you're buying equipment and software and ask for training recommendations.

Get the right equipment. Besides the obvious (server, microphone, speakers and encoding and streaming software), you will probably want to invest in sound editing software (we recommend Sonic Foundry's SoundForge system) to clean up poor-quality recordings, add voice-over tracks and so on.

We also discovered that streaming MP3 was a near-impossible proposition without a fast hardware encoder.

Storage will multiply. Each streaming audio file is optimized for specific data transmission rates.

Unless you can guarantee that every listener will be coming to you at T1 speeds, count on keeping two or more versions of every sound file on the server.

You will want to store a 36K or 48/56K bit/sec. edition for modem telecommuters and public surfers, as well as a high-speed version for network and cable modem/DSL users.

If you're planning to release sounds to the public on your Web site, you will also want to take the variability of the Internet into account; heavy congestion can make for tortuous streaming, so you should probably count on also offering an on-demand (downloadable) copy of your streamed sound files. The problem is less acute, of course, on your internal network, but you should be prepared to face sudden jumps in network traffic when new sound files are posted. ◗

Hall is a performance test engineer and Hayes is a systems controls manager at Client/Server Labs Inc. (www.cslinc.com) in Atlanta, a primary test lab partner for Computerworld.

MOREONLINE

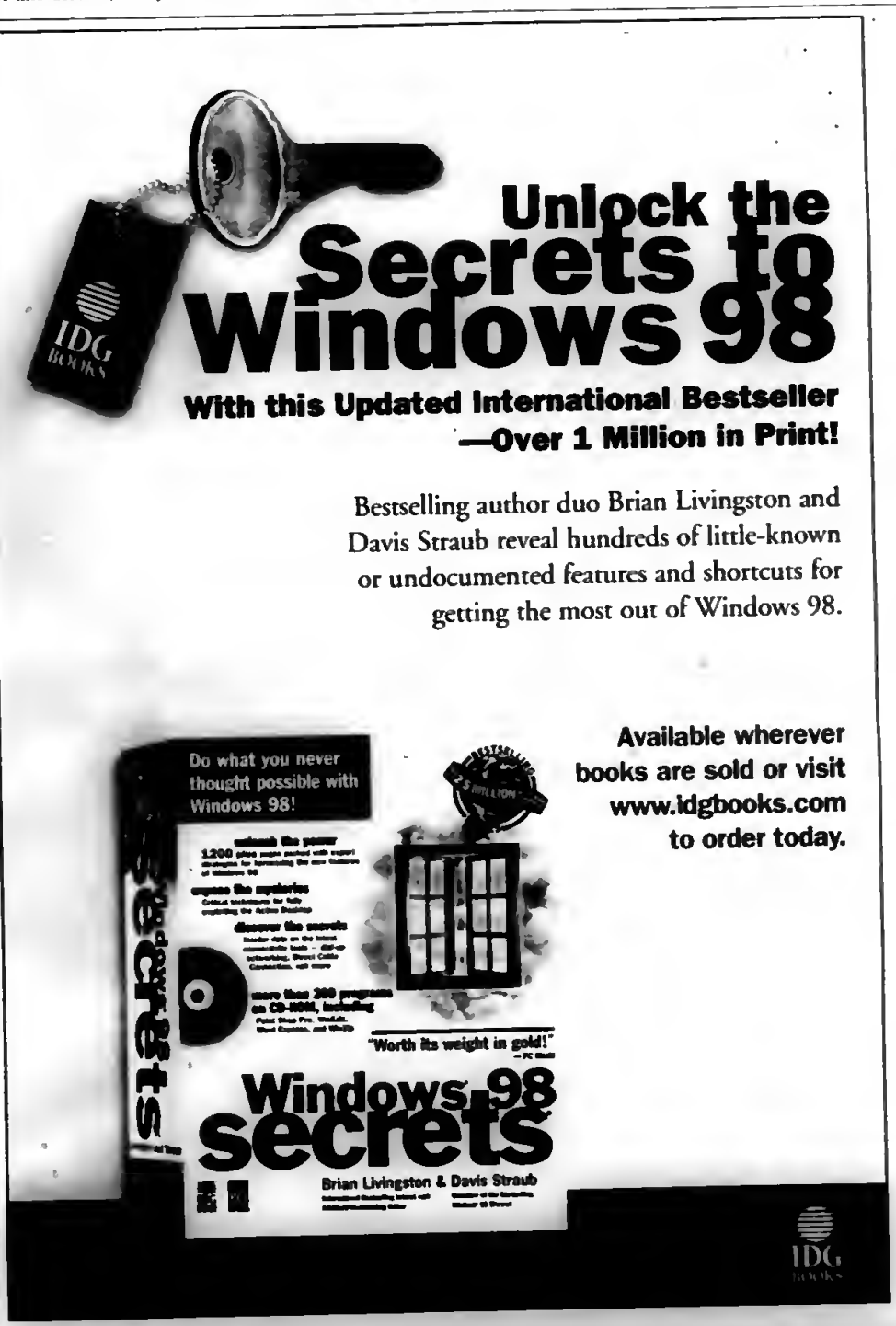
■ For further information on these codecs, please visit these developers' sites.

Microsoft Windows Media: www.microsoft.com/windowsmedia

RealNetworks' G2: www.realnetworks.com

MP3: www.mp3.com www.bitcasting.com, www.audioactive.com (Telos Systems)

Apple QuickTime: www.apple.com/quicktime



Bow Street Offers A Custom Data Fit

Combines XML with directory services to ease the pain of custom data access

BY CYNTHIA MORGAN

HOW DO YOU convince 2,000 customers and suppliers that they're each getting special treatment? Web personalization, of course.

Trouble is, each customer may require a slightly different data grouping or need different data formats at different times of the month. No matter how you slice the data, it's a lot of custom Web-page building.

Relationship management tools target that problem by automating data-gathering and dynamic Web-page creation. In the past year, most vendors of relationship management tools have either switched to Extensible Markup Language (XML) or added XML support to their tools. Start-up Bow Street Software Inc. in Portsmouth, N.H., takes that a step further by combining XML tagging with network directory authentication.

Bow Street's Web Services Architecture (WSA), now in beta testing, adds what may be the smartest step of all: Instead of requiring information technology managers to spend hours building and maintaining a separate database of clients and authorizations, WSA relies on the network's own directory services to provide information needed to authenticate users and track which data they may view.

Integration

The product works with popular directory services such as Novell Inc.'s Novell Directory Services and Lightweight Directory Access Protocol and will support Windows 2000's Active Directory when it ships.

Corporate users are rapidly discovering the value of XML, a Web-based data description language, and its industry-specific extensions such as Open Financial Exchange and vendor consortium RosettaNet's supply-chain definitions.

Easier for Managers

Using these, an IT manager can structure an XML document that precisely describes the nature of the content, where it should go and what should happen to it when it arrives. The data can also be reused in other applications, online and off-line, as often as necessary.

"From an IT manager's perspective, pieces of information are no longer presented on a Web page in a series of hard-coded links," said Jack Serfass, Bow Street's CEO and co-founder. "Instead, they're a repurposable set of services in a directory."

Once formatted with XML tags, the data can be used virtually anywhere. Also, unifying data management and Web creation lets IT build templates or forms that a business manager can use to write specifications for Web content without any coding at all.

Marketability

Once information is tagged as a network resource and tied into the directory, it can become a commodity for sale or lease like any other product.

NetRatings Inc., a Nielsen Media Research Inc.-owned research firm in Milpitas, Calif., sells its Internet marketing data to other information providers and uses Bow Street to pull exactly the data a client wants from a vast array of information.

"The Bow Street solution is letting us literally become a 'data OEM.' Once you can slice and dice the data, you can supply any combination of any data to each customer," said David Toth, president and CEO of NetRatings.

"Before Bow Street, we'd have our engineers create a customer query and report page for each customer, or we'd have analysts pull data together and fax or mail it to the customer. We tried to automate using Oracle, but it turned out to be pretty intensive engineering work," Toth said. "We've extended our marketing reach from the $50,000 level down to the $10,000 customer. With Bow Street, we can afford to do it." ▶

BOW STREET Chairman Frank Moss and CEO Jack Serfass have customized Web data management without the hard-coded links

Bow Street Software Inc.

Location: One Harbour Place Portsmouth, N.H. 03801

Telephone: (603) 436-9100

Web: *www.bowstreet.com*

Niche: XML- and directory-based customized data management and presentation

Why it's worth watching: Bow Street lets business managers set up highly customized business-to-business data access on the Web without IT hand-holding.

Company officers:
- Frank Moss, chairman and co-founder
- Jack Serfass, president, CEO and co-founder
- David G. Sweet, vice president and co-founder
- Joe Sommers, vice president and co-founder

Milestones: Company founded January 1996; first product ships this summer

Employees: 35

Burn money: Funding comes mainly from venture capital heavyweights such as Kleiner Perkins Caufield & Byers, Charles River Ventures and Matrix Partners.

Product: Web Services Architecture

Customers: NetRatings Inc. *(www.netratings.com)*, Travelers Property Casualty Corp. *(www.travelers.com)*

Red flags for IT: Lots of up-front work. Nontechnical business managers can easily build new Web sites for customers, but it takes experienced coders to design and build the required templates first. (Bow Street can build them for you.)

COMPUTERWORLD emerging companies

the buzz
STATE OF THE MARKET

Bow Street Software

Though Bow Street's reliance on outside directories makes it fairly unique, many start-ups are chasing the XML connection. Top contenders:

Vignette Corp.

This 4-year-old vendor, which makes StoryServer and the new Vignette Syndication Server, is an old hand at content management. Last year, it added XML extensions, a visitor profile creator and report generator to the Syndication Server. While StoryServer doesn't have Bow Street's directory services be-in (thus forcing developers to develop their own directory and authentication systems), it does offer the ability to combine internal data with external data entry on the fly. The company is in the process of acquiring information delivery service Diffusion Inc., which should give StoryServer the ability to access data via fax, telephone, pager and the Web.

■ Vignette Corp.
Austin, Texas
(888) 608-9900
www.vignette.com

BroadVision Inc.

BroadVision is a relatively ancient (in Internet years, at least) company, founded in 1993. It launched a new version of its popular package, One-To-One Business Commerce (1to1BC), earlier this month, making some of its obscure customization features easier for nontechnical managers to understand. Warner Bros. Inc., Circuit City Stores Inc. and Fingerhut Cos. use 1to1BC.

■ BroadVision Inc.
Redwood City, Calif.
(650) 261-5100
www.broadvision.com

WebMethods Inc.

In some ways WebMethods wrote the book, or at least a standard, for automated Web data access. In 1997, the company's Web Interface Definition Language was one of the first to provide a common XML interface between the Web and databases, middleware and existing business applications. Its Web Automation product line offers an XML-based data repository that lends itself to flexible automation; it's driving online catalogs and aggregating data at the likes of the U.S. Postal Service.

■ WebMethods
Fairfax, Va.
(703) 352-8501
www.webmethods.com

– Cynthia Morgan

Corporate Portals

BY DAVID ORENSTEIN

A USER CHECKS his e-mail, looks up the current company stock price, checks his available vacation days and receives an order from a customer — all from the browser on his desktop.

That is the next-generation intranet, also known as a corporate portal. With it, "the browser becomes the dashboard to daily tasks," says Bridget Leach, an analyst at Giga Information Group Inc. in Cambridge, Mass.

A corporate portal's job is to bring important information from both inside and outside the company to the desktop. It also filters the majority of extraneous information such as thousands of intranet pages meant for others' eyes or errant e-mails that apply to workers in other departments.

Complex to Build

Portals that perform those tasks to their fullest are very difficult to build. Hadley Reynolds, an analyst at The Delphi Group Inc. in Boston, says corporate portals require eight layers of technology (see chart at left). Wayne Eckerson, an analyst at Patricia Seybold Group in Boston, says he believes vendors must be able to provide 15 areas of functionality for their offerings to be considered sufficient.

It's the layers and functions that make a portal so complex. It's not just a Web page with a bunch of links to interesting sites. Instead, it's a page that presents users with data from structured sources such as databases, spreadsheets and enterprise resource planning (ERP) applications, as well as unstructured data from Web pages, documents and e-mail. It includes a search engine and lots of intelligently categorized and classified listings of thousands of pages of intranet-based information.

It might include a news feed from the outside world and can even include the groupware products that allow workers to collaborate on projects. The idea of having so much going on in one window is a new model of desktop computing, Reynolds says.

No Easy Answers

Although analysts' opinions vary about how much of the work vendors can do for a company, "an easy solution is years away," Reynolds says. "There is no portal-in-a-box." But many vendors are offering partial answers based on their relevant expertise in the market. In a recent report, Eckerson wrote, "The 1.0 versions of most business portal products will be lightly rehashed versions of products that were once labeled 'business intelligence' tools or 'document management' tools." More-complete products may begin to appear toward the end of this year, he predicted.

Anne Jean-Blanc, an architect at Caterpillar Inc. in Peoria, Ill., says the industrial vehicle maker's quest to set up a corporate portal has involved a review of products from vendors including Verity Inc., Dataware Technologies Inc., Viador Inc. and Plumtree Software Inc. Portals can be a pricey proposition, she says. With 65,000 employees, Caterpillar could easily end up spending millions of dollars on the software licenses that cost $10 or $20 per user.

Still, Reynolds says a good portal can't be produced by even a great webmaster. Companies that try to build portals on their own might take years to finish the job and could end up with a portal that's out of date when it's done, he says.

DEFINITION

A corporate portal integrates internal applications such as e-mail, database access and document management with external applications such as news services and customer Web sites. It's a Web-based interface that gives users access to all those applications through one screen on their PC.

AT A GLANCE

What's behind that portal?

Corporate portals can involve several layers of multiple technologies, making them complex to build.

Presentation: Standard Web display technologies such as HTML, JavaScript and applets or Cascading Style Sheets plus data visualization technologies like Web OLAP that run applications like an e-mail viewer within the browser

Personalization: Agents that filter information for individual users. They might suggest what users would be interested in and can learn from what users do.

Collaboration: Groupware technologies such as discussions, chat sessions and project libraries.

Process: Technologies such as online transactions that are the engines of various business or workflow processes.

Publishing and distribution: Storehouses of documents in portable formats like Portable Document Format as well as publish/subscribe engines or other means of "pushing" information

Search: Both full-text search engines and ones that search descriptions of documents and other content.

Categorization: Tools to create and maintain categories. Categories must be varied for different audiences that look at the same documents and data in different ways.

Integration: Tools to access disparate back-end data sources such as relational databases and ERP packages. In addition, tools that bring in data feeds from the outside, such as news or stocks. Indexes structured and unstructured data from file systems, Web servers and e-mail.

SOURCE: THE DELPHI GROUP INC., BOSTON

Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to QuickStudy editor Stefanie McCann at stefanie_mccann@computerworld.com.

MORE ONLINE

For more information about corporate portals, visit our Web site.

www.computerworld.com/more

GPS Marks the Spot

BY DAVID ESSEX

FEW EXPERIENCES are as nerve-wracking as getting lost during a tightly scheduled business trip on which you're both driver and navigator. But there's a promising antidote to frantic U-turns, chronic lateness and stewing in traffic. In-car navigation systems that link with the 24 satellites in the U.S. Department of Defense's Global Positioning System (GPS) can identify your position to within a few hundred feet. Combined with street maps and algorithms that can issue directions, such systems make navigation a near-foolproof sequence of turn left, turn right or go straight until I say otherwise.

GPS has been around for two decades as a military tool, but civilian uses such as aviation, recreational boating and tracking of truck fleets started in 1984 when the satellites were made available for commercial use. A fast-growing part of the consumer segment is pricey hard-wired systems like Philips Electronics NV's Carin and the Neverlost, a talking system installed in some Hertz Corp. rental cars [CW, July 13, 1998].

But the trend is toward cheaper, more flexible car navigation, and that generally means cell-phone-size GPS receivers that display street maps, or smaller receivers running off notebook PCs. The notebooks' power opens up a world of color maps and CDs that hold information about nearby restaurants, hotels and attractions and that help drive prices down by enabling GPS receivers to shed display and storage functions. The increase in portable computing power in recent years has, in fact, produced greater variety in car-navigation systems, from Microsoft Corp.'s Windows CE-based Auto PC to mininotebooks that sit on the dashboard to GPS technology that runs off handheld PCs.

In a September 1998 study, the U.S. Department of Commerce predicts that the GPS industry will grow by 25% annually through 2003, to a whopping $16 billion.

I tested three products that embody the latest in GPS for business users. Garmin International Inc.'s NavTalk is a combination cell phone/GPS receiver (by 2002, all cell phones must have GPS for emergencies, the Federal Communications Commission says). DeLorme's Earthmate GPS Receiver was the first to work with palm-size computers. And TravRoute Software's CoPilot 2000 is the gadget geek's choice: a talking notebook/GPS combo that makes up for its artificial-sounding voice by gently offering turning instructions and a heads-up right when you need them. It's my hands-down — or should I say hands-off? — favorite.

Essex is a freelance writer in Antrim, N.H.

NavTalk

Garmin International Inc.
www.garmin.com
$625

Garmin's product line is deep in all-in-one handheld devices mostly for recreational use, so it's no surprise the company melded its GPS III device with a cellular phone, creating the NavTalk. All cell phones will eventually have GPS chips so emergency calls can be traced. The NavTalk does have one-key access to 911, but the infrastructure isn't there to tie your location to your call without an additional service that Garmin offers for $9.95 per month. Two NavTalk users can, however, use each other's locations.

The NavTalk's backlit 1.5- by 2.5-in. monochrome screen is easy to read, but the maps show only major routes in the U.S., Canada and South America. A PC cable lets you load local maps from a CD-ROM, but I found them less detailed than those of the DeLorme and TravRoute products, and the online documentation didn't say how the maps affected the NavTalk's preinstalled ones. On the road, the GPS display quickly showed my exact location, albeit on a rudimentary map (the stick-figure equivalent of the CoPilot 2000's color maps). A highway page names the road you're on and shows the compass reading, speed and time to destination.

The NavTalk is an new that Garmin didn't have all the documentation ready, so I had to use a small pamphlet to muddle through the 16 main GPS screens (four for the phone). Because of its reliance on a handful of rubberized buttons and cryptic screens, the powerful NavTalk is best for techies with the knack or patience to master it.

Solus Pro

(with Earthmate GPS receiver and Street Atlas USA 6 software)
DeLorme
www.delorme.com
$198.95 (entire package)

DeLorme's notebook navigation system, with its distinctive yellow Earthmate receiver, is intriguing in its own right, but what's truly new and different is Delorme's Solus Pro add-on software for handheld computers. I used it with a 3Com Corp. Palm IIIx, although it also works with other 3Com Palms and with Windows handhelds.

After loading the Earthmate and Solus Pro software on the notebook, you must transfer the Solus Pro application file, local map and directions from the notebook to the handheld. (This took me several hours because of 3Com's nonintuitive HotSync program and a serial-port conflict it had with the Earthmate GPS Receiver.) Then you connect the same GPS receiver to the Palm, leaving your notebook at home. The receiver and handheld, each the size of a deck of cards, make a portable duo, but my cable kept coming loose from the Palm IIIx.

The fuzzy monochrome map slowly updates during your trip. A number on the map corresponds to the relevant turning point in the directions, which you must access from a different screen. Overall, the maps and directions are more detailed and easier to follow than those on an all-in-one GPS receiver like the NavTalk but much inferior on both counts to the full-size color screens of notebook-based GPS. They seem best suited for short trips.

CoPilot 2000

TravRoute Software
www.travroute.com
$399

TravRoute's CoPilot 2000 is the brash, colorful, talky show-off of the three, but that's not what makes it a winner. Its elegance comes instead from its ease of use – from software installation and hardware setup to the way it dictates just the right amount of driving instructions at the right times, with a large-print version always up on screen. I found it more helpful with directions and easier to understand overall than either the Solus Pro or NavTalk.

On the other hand, setting up a trip was tricky because the software doesn't make it clear how to identify the origin and destination. But once I figured out how, I could easily change both on the fly while sitting in my parked car. You can also ask CoPilot 2000 spoken questions like "Where am I?" and "What's the next turn?" I found myself comfortably alternating between the spoken and on-screen directions without losing my view of the road.

CoPilot 2000 is more business-oriented than the others with its ability to import customer contacts and automatically choose routes for up to 50 stops identified by the addresses in the database. You can also stay in close touch with the office by sending two-way radio messages through the software (assuming your notebook has the right hardware) and look up business and travelers' services for every exit on the U.S. federal highway system. All told, CoPilot 2000 combines gee-whiz technology with genuine usefulness at an affordable price.

IT'S NOT HOW MUCH YOU READ.

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Persuasive Technologies

Computers' growing ability to alter users' behavior may make your Web site more effective – but may also raise a host of ethical questions By Gary H. Anthes

A VIRTUAL-PET screen saver from Hewlett-Packard Co. encourages you to use more HP ink cartridges by rewarding your pet with virtual toys wheo you print a document. A Web-based auction company seduces you into placing bids by positioning itself as a game rather than a shopping site. A computerized doll cajoles secrets out of your child. A monitoring system in the rest room of the restaurant where your teen-ager works logs his identity if he fails to wash his hands.

These are real examples from a nascent field known as "captology" — computers as persuasive technologies. Today, persuasive technologies are found mostly in niche applications, but captologists say they're headed for much wider use, including mainstream corporate information systems.

Computers can persuade — intentionally alter users' attitudes or behavior — through a variety of means, including flattery, seduction, fantasy, competition, humor, positive reinforcement and appeals to conscience. In so doing, they can make significant contributions in fields such as health, safety and education.

But the line between beneficial persuasion and manipulation and coercion can be fine indeed, and captology brings to information technology difficult ethical questions. Indeed, captologists worry that a highly publicized mishap or crime hinging on persuasive technology may invite government regulation and put a chill on the development of new applications.

For the most part, oeither the persuasion philosophies nor the technologies employed are new. What's relatively new is the marriage of the two. "Psychologists know a *lot* about human-to-human interaction," says Clifford Nass, a psychology professor at Stanford University. "So you can start from 100 years of psychological research and apply it to design of technology."

Captology's Infancy

B. J. Fogg, who heads the Persuasive Technology Laboratory at Stanford, coined the word *captology*. He says he became interested in the subject six years ago and was amazed to learn that virtually no research had been done oo it. "We've worked so hard in the computer industry just to get things to work that looking at persuasive technologies was a luxury," he says. "It just shows

that the computer field is maturing now that we are getting into the psychological aspects of working with computers."

Fogg edited a special section on captology in the May issue of *Communications of the ACM* (*www.acm.org/cacm*) that describes several applications of persuasive technologies. The applications are also cataloged at *www.captology.org*.

The soaring use of the Web has stimulated interest in persuasive technologies as companies increasingly attempt to influence external users. In fact, most sites already use captology, albeit io rudimeotary ways — they just don't know it. "Most Web sites use persuasive strategies in some way, and not just for selling," Fogg says. "It could be getting you to register, getting you to share personal information, getting you to bookmark the site and so on."

Another trend driving the use of persuasive technologies is the growing role of non-IT people in defining applications, Fogg says. For example, be says, it was the food people at Dole Food Corp. who shaped the persuasive technology Dole calls 5-A-Day Adveotures (*www.doleSaday.com*). It's a CD-ROM that uses animated characters, music and games to encourage childreo to eat five servings of fruits and vegetables per day.

Lighten Up

Fogg says some of the creative approaches to reaching children with computers might be applied in corporate IT. "I often think that corporate systems are way too serious and people would respond really well if we got a little more playful and made their jobs a little more fun," be says.

Systems are not only too serious, but also sometimes rude, Nass says. He says he helped a company make its computer interface to an oscilloscope more acceptable to users by making error messages more polite — for example, changing the accusatory, "You set this setting too high" to the more passive, "This setting is too high."

After be changed hundreds of "impolite" error messages, users said they liked using the test instrument more. "And they actually thought the oscilloscopes were measuring better," Nass says.

Daniel Berdichevsky, executive director of DemiDec Resources, an educational firm in Los Angeles, says there are opportunities to apply persuasive technologies even to the most mundane corporate applications. He points to the animated paper clip in Microsoft Word, which attempts to persuade users to ask for help by making the experience a little more fun.

Reciprocity can be a strong persuader as well, says Berdichevsky, who's also an associate manager at the Persuasive Technology Lab. An application meant to encourage users to, say, pay a bill could help accomplish that by giving users some useful or fun informatioo wbeo the bill is presented. "Our studies have shown that users who work with computers that they feel have done them favors will in turn do favors to the computer," he says.

The persuasive technique of choice for Drugstore.com Inc. is user education. Indeed, far more information is available at its Web site than at brick-and-mortar pharmacies, says Andy Cargile, group program manager. "It's not just selling a product, it's selling the *right* product," he says. "We believe in a very strong user experience, and that's where the persuasive technology thread comes in."

Shoppers at Drugstore.com can invoke several automated "shopping advisers" that gather a small amount of information about users and then guide them to the right products. For example, after learning a shopper's skin type, age and allergies, an adviser would recommend a sunscreen product with tbe proper sun protection factor (SPF). It would also offer to explain what SPF means, give tanning advice and provide links to related topics such as skin cancer.

Phillip King, a hardware design engineer at NetSchools Corp. in Mountain View, Calif., says a corporate application could use persuasive technologies to direct users toward higher-level goals. For example, a purchasing system could encourage the use of preferred vendors — those that are felt to be environmentally responsible, say — while discouraging doing business with unfriendly nations.

"But," King cautions, "then the question becomes, Who's setting these policies? You start to get into questions of persuasion vs. coercion."

A Fine Line

Indeed, captology raises several questions of ethics. Technologies are unethical if they persuade users by misleading or misinforming them, if they trick them into giving up their privacy or if they encourage them to take actions that are harmful or later regretted.

But sometimes it's hard to say just when a persuasive technology crosses the line. For example, it would be easy for Playmates Toys Inc. to make Baby Whispers, the doll that prompts a child to confide secrets, also to record those secrets for later downloading by a parent or teacher. The idea might well be put to beneficial use by the parent, but the idea is troubling to some.

Would it be unethical? "You'd have to look at that very carefully," Berdichevsky says. "Here children are viewing a computer as a confidant — not as a journal device, but one by which their secrets are being actively pried out of them. What effects will that have on children later in life when people try to break down tbeir barriers?"

As for the system that monitors employees' hand-washing, "that's getting close to Big Brother technologies," Berdichevsky says. "You're intruding into a significantly private space, although for good and valid health concerns." He says he'd prefer the use of a "Little Sister" technology that beeped if the employee dido't wash his hands — but didn't snitch to the boss.

Fogg warns that publicity about an unethical use of persuasive technologies — "something as simple as persuading a child to type in their parent's credit-card number" — will trigger government regulation. "When something really socially undesirable happens — and it will — tbe reaction would be to legislate strongly, and that could cut off a lot of great things down the road," he says.

Cargile says ethics are "key" in Drugstore.com's use of persuasive technologies. "In the case of our [automated] shopping advisers, we drew a line in the sand and said they should not offer anything that you would not get from a pharmacist," be says.

For example, an attempt at Drugstore.com to find a sunscreen for a baby less than six months old results in a message advising that very young babies shouldn't he exposed to direct sun, nor should sunscreen products be used on them.

Asked if it's always that easy to resolve the ethical issues that crop up in persuasive technologies, Cargile says, "If you think it's easy, it probably means you are missing something."

"We'll have a future where persuasive technologies will be very common," Fogg says. "There will be those we choose for ourselves and those that will be imposed on us. It's the second category where a lot of ethical issues crop op."

Anthes is Computerworld's editor at large. His Internet address is gary_anthes@computerworld.com.

Those Four Little Words

In captology, subtle changes can make all the difference. For example, Daniel Berdichevsky of the Persuasive Technologies Lab at Stanford says studies show that users are much more likely to comply with a request when they're given a reason – even if the reason is circular, self-evident or meaningless.

For example, let's say your company's billing system prints on invoices "Please pay your bill promptly." Try adding four words: "Please pay your bill promptly because it is due."

Incredibly, such a change "can increase compliance sevenfold," Berdichevsky says.

— *Gary H. Anthes*

FINDING A FIT FOR MINIMO

OBILES

Handhelds are packed with potential, but in practice, their use doesn't match their promise By Christopher Lindquist

TODAY'S HIGH-TECH handhelds are more powerful than ever. So, wouldn't you know, most people are using these pocket-size wonders for wimpy applications such as keeping track of their calendar and contacts.

They're using them as paper-planner replacements, even though vendors have added color screens, e-mail capabilities, internal spreadsheets, infrared links — eveo wireless Internet connections.

Why? According to a recent *Computerworld* survey of 150 business managers, most users love their handheld computers, but they aren't always pleased with individual features. Besides, although not everybody needs to beam business cards to someone across the room, the handheld had better keep track of who they need to meet — and wheo — if they're going to survive. And according to users, these handheld memory-replacements do the job nicely.

For survey purposes, handhelds were defined as pen-based computers, palmtop PCs with keyboards and phone-based devices.

Most people may not be using their handhelds to ride the cutting edge, but they are using them — and coming to rely on them.

Feature Failure

A close look at the survey would hardly indicate that handhelds buyers were overwhelmed with love for the individual features and functions of these small devices. The 150 surveyed users, using a five-point scale, gave their handhelds mean ratings that ranged from a low of 3.0 for infrared functions and number of serial ports to a high of 3.8 for ease of synchronization with desktop applications, operating system and memory. Scores for screeo clarity/brightness, battery life and usability as an input device were average. With scores like that, handhelds would never make the honor roll.

Despite those low ratings, however, the vast majority of users said they were happy with their handhelds: More than 95% reported they were satisfied or very satisfied with their devices. And 90% said they would recommend their favorite handheld to a friend.

The apparent conflict between satisfaction with individual features and overall satisfaction may in part be a result of low expectations. Early handhelds were oversized, clumsy to use and underpowered. The fact that today's devices are small, convenient to carry and do a decent job storing names, addresses and appointments is enough to keep most users happy.

And if you're happy, sometimes there isn't much incentive to change. Mary Durward's DOS-based Hewlett-Packard Co. 95LX hasn't been cutting-edge for nearly a decade, and its HP 12-C financial calculator emulation has been matched in software by other devices. But that ancient palmtop still has a feature that no other handheld can touch: a separate numeric keypad. As assessor for St. Louis County, Durward spends much of her day figuring property market values; moving to a newer handheld that doesn't have the stand-alone pad could put a serious crimp in the productivity of someone who can practically touch-type numbers on a 95LX.

That crimp is eveo enough to keep Durward from indulging her penchant for moving with the times. "My style is to keep up with newest and latest technology," she says. "It's just killing me to still be using this."

But though the keyboard is important to Durward, most survey respondents appear willing to trade keys for stylus. Nearly 63% of them reported using a palm-size device without a keyboard. Only 31% feel the need to keep QWERTY under their fingertips.

Continued on page 80

I might look at others, but they'd have to be awfully good to unseat this PalmPilot.

RUSSELL FULLER,
NEW YORK STATE ELECTRIC & GAS CORP.

FINDING A FIT FOR MINIMOBILES

Continued from page 79

3Com Corp.'s Pilot dominates the keyboard-free handhelds with nearly 72% of respondents choosing a type of Pilot.

Russell Fuller, project manager at New York State Electric & Gas Corp. in Binghamton, N.Y., has been a member of the Pilot faithful for years, ever since he saw the PalmPilot 5000 during a launch event. Impressed by the device's handwriting recognition and compatibility with existing software, he bought one that day and hasn't looked back since — nor does he expect to wander far afield in the future: "I might look at others, but they'd have to be awfully good to unseat this PalmPilot," he says.

Although Fuller primarily uses the Pilot to manage his contacts and schedule, other users take advantage of the latest Pilots' more advanced features, such as infrared functions. Kevin Kenward, director of Survey and Data Resources at the American Medical Association in Chicago, says he uses his 3Com Palm III mostly as a contact manager but says he also takes advantage of its infrared connection capabilities for "beaming" memos to people in meetings to ask them to follow up on items without disrupting the proceedings.

The Pilot has even made converts of those who owned older handhelds. Chris Perry, national sales and marketing manager at A-T Financial Information in Chicago, is one of the Palm believers — and he's tried others. "I was a Newton owner many years ago," he says. "While I loved the functionality, [its] size was a problem." But as of early this year, Perry decided it was time to go electronic once again. After investigating Windows CE devices — and deciding that the CE market was too confused — he chose the Pilot III because it was the device he saw most often.

Like most respondents, Perry says he uses his handheld primarily as a replacement for a paper organizer. However, he's also in the minority (less than 25%) that uses it for e-mail management. That function has proven valuable for helping Perry keep his time under control. "When I'm on the road, on a train, on an airplane or whatever, I can go through my old [Lotus Development Corp.] CC:Mail messages and delete things," he says. "And when you have time, you can actually write short replies." Upon returning to the office, Perry syncs up to quickly send and delete messages and gets on with other business.

Jack Smith, associate director of access services at Lister Hill Library at the University of Alabama at Birmingham, handles his e-mail in a similar fashion. But for Smith, the Pilot's real benefit is the fact that it can organize his whole life — not just his time at the library. "I have three careers," Smith says, noting that he works as a musician and is heavily involved in his church. (Smith isn't alone: 19% of survey respondents acknowledged keeping personal information on their handhelds. However, we wouldn't be surprised if that figure were a lot higher because people may not want to admit they use handhelds for personal stuff.) The Pilot lets him keep track of all his responsibilities in one place, Smith says.

Typecast

Most users are willing to forego a keyboard in favor of ultimate portability, but that isn't the case for everyone. For instance, a pen-based handheld wasn't sufficient for Dennis Bowling — a sentiment he shared with 31% of the survey respondents who also chose devices with keyboards. Although Bowling, vice president at civil engineering firm Rick Engineering in San Diego, needed something smaller than a standard laptop to carry on business trips, he wanted the convenience of a keyboard for managing documents such as job lists and financial spreadsheets. "I just don't like writing on the screen," he says. "And a lot of the Pilots and things are really neat for addresses and phone numbers, but that's about it."

HP's 620LX palmtop fit the bill, offering Bowling a usable keyboard and the convenience of Windows CE's familiar interface and applications, including Excel and Word, which, he says, eliminated the learning curve. And when it comes time to travel, "You can slip it in your briefcase, and you don't have another carry-on," he says. "That's a big deal."

Continued on page 82

MOTOROLA INC.'S STARTAC CLIP-ON Organizer actually attaches to a StarTAC phone. The organizer measures 4.6 by 1.89 by 0.87 in., which doesn't include phone measurements, and weighs 2.3 ounces

THE PALM V is 3Com's attempt to reduce the size of an average Palm. It measures 4.5 by 3 by 0.4 in. and weighs 4 ounces

Survey Highlights

Our survey indicates that users are pretty darned satisfied with their handhelds.

Looking at the scores from 150 users in four categories (palm-size with no keyboard, CE handheld with keyboard, subnotebook and phone format), we found that 53.3% are satisfied, and 42% are very satisfied. The "very satisfied" respondents included 47.9% of users of palm-size devices without keyboards and 34.1% of users of CE devices with keyboards.

A key question to the users: Would you recommend your product to a friend? Across the board, 90% of the users said they would, with the palm-size and subnotebook users taking a big lead on this at 93.6% and 100%, respectively.

But the most interesting point to note is that although users seem to like their products, they aren't very happy with several of the individual functions and features.

Across the board, on a scale of 1 to 5, with 5 being the highest grade and 1 the lowest, users gave modest grades to battery life (3.4), infrared functions (3.0), use as an input device (3.3) and number of serial ports (3.0). In the serial ports category, phones dragged the average way down with a score of 1.0.

Phones trailed far behind the others in ease of synchronization at 2.5. On the other hand, phones scored the highest in screen clarity/brightness at 4.0, while subnotebooks scored the lowest at 3.2.

Some devices emerged as clear leaders in ratings of certain features and functions. For instance, users of CE-based handhelds gave high marks to data entry (4.0), while phone users gave data entry its lowest rating (3.0).

Palm-size and CE handheld users' scores indicate that they're pleased with the scheduling/calendar functions, grading them at 4.2 and 4.1, respectively.

The subnotebook and phone users, on the other hand, weren't so pleased in this area, with both giving their devices a grade of 3.0.

Address book grades were along the same lines, with palm-size and CE handheld users awarding their devices higher grades of 4.4 and 4.5, and subnotebook and phone users giving lower scores of 3.0 and 2.5, respectively.

The only category in which all users gave their devices high marks was overall appearance, with scores ranging from 4.0 for subnotebooks to 4.17 for CE-based handhelds.

Other Notables:

Forty percent of subnotebook users indicate that they primarily use their devices for retrieving e-mail. Meanwhile, 50% of palm-size users and 41.5% of CE handheld users say they primarily use their devices for scheduling/calendar purposes, and 50% of phone-format users say they primarily use the address-book function.

When asked about the price of their product, 37% of phone-format users said their product was very expensive, compared with users in other categories, who said the price was fair.

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FINDING A FIT FOR MINIMOBILES

Continued from page 80

The full keyboard and lightweight portability of a Compaq Computer Corp. 2015c also attracted the attention of Thomas Pond, data processing manager for the city of Northglen, Colo. "I use it almost exclusively when I'm out of town," Pond says.

The device's built-in modem lets him quickly dial in to retrieve e-mail or access a host system via a terminal emulator. Those tasks used to be handled by Pond's heavier notebook computer, "but I lugged it all across Europe last year, and I decided that sucked," he says. "All I was doing was checking my mail; I didn't need the full capability of the laptop."

Pond says he's satisfied with the system's keyboard, display quality, portability and flexibility, but isn't as pleased with other features. For instance, Windows CE isn't well-suited for synchronizing with multiple hosts, he says. "I thought, 'Well, gee, this would be wonderful to transport data back and forth between home and work,' but I can't get it hooked up to both systems. It seems to want to only work on one or the other."

Still Not Perfect

Problems in synchronizing were but one of many problems handhelds owners complained about.

"Battery life is kind of a drag," Bowling says of his 620LX, echoing an opinion held by many survey respondents. Though it causes serious problems only while on the road, he says. "I've gotten in the habit: When I come into work in the morning, I plop it down in the charger."

Pond's solution for the three- to four-hour life of his 2015c was to buy a second battery. On one cell, "If you fly from New York to L.A., you don't make it," he says.

And though the AMA's Kenward may be getting good use out of his Pilot's infrared connector, handhelds users in general find infrared to be a borderline failure, according to the survey. Users also reported that they would like to see improved input devices — better keyboards and enhanced handwriting recognition. And they'd like their systems to come with more memory.

Most handhelds also lack communications features. Although add-on cellular and radio-wave modems are available, they increase the cost and reduce the convenience of what's supposed to be an ultraportable device. 3Com's recently unveiled Palm VII connected organizer, with its built-in wireless data network connection, makes inroads toward remedying the situation. But some companies are attacking the problem by choosing devices designed for communications first and other functions second.

Take cell phones, for example. Although not handhelds in the strictest sense, the latest phones combine a variety of communications tools — from standard dialing to text messaging — with contact list features that allow for convenient communications from anywhere to anywhere. That's critical for Mike Land, site administrator at Los Angeles International Airport (LAX). Land maintains the airport's computer systems, which are spread throughout the huge facility. "My office is six stories high, a half-mile across and a quarter-mile deep," he says.

To keep in touch with his technicians, Land went for Nextel Iden i1000 phones to replace a jumbled tool kit of radios, cell phones and pagers. "If I'm in one corner and the person I need to talk to is in the other corner, it literally used to take us two hours to find people sometimes, even with pagers. Now, it's instantaneous."

Company Standard

Land's company pays for his hardware — as is true for 61% of the survey respondents. But barely more than 19% of the companies select the actual make and model — demonstrating that most firms have yet to standardize on handhelds the way they have on laptops and desktop systems. And none of our in-depth interview subjects uses line-of-business applications customized to their portable device.

> If you fly from New York to L.A. [on one cell], you don't make it.
>
> THOMAS POND, CITY OF NORTHGLEN, COLO.

But that doesn't mean there isn't interest in making handhelds a more integral part of information technology. Perry says he's looking to outfit more people with handhelds once he gets a feel for what will happen in wireless communications. For instance, he says, the Palm VII could be useful both for in-house applications and as a means of distributing market data to customers.

And Land says LAX is looking for wireless devices that could automatically track baggage and remotely update the airport's computers. "The key to our industry right now is getting the bags with the passengers," he says. "Right now, everything is done manually." And because Land spends precious few minutes in his office on any given day, having a palmtop that could give him instant wireless access to e-mail is also very appealing.

"I must answer a hundred e-mails a day," he says. "If I could just sit down at the check-in counter while I'm waiting for a client to show up and hit the button and have it connect to the system and download [e-mail] automatically, that would make my life a lot easier."

Considering consumer demand for ever-improved devices, Land and Perry shouldn't have long to wait. According to Dataquest in San Jose, the handhelds market leapt more than 61% to 3.9 million units from 1997 to 1998. And it's poised for further growth this year. As companies begin to integrate handhelds into their IT infrastructures, an already hot market should be in for a boost. ▶

Lindquist is a freelance writer and reviewer in Moss Beach, Calif.

SUBNOTEBOOKS are the largest in the minimobiles category. This TinyNote from Mag Portable Technologies Inc. measures 10.9 by 7.0 by 1.4 in. and weighs 3.6 pounds

THIS LARGER-FORMAT H/PC Pro device, the Jornada 820 from Hewlett-Packard, runs on Windows CE. It measures 9.7 by 7.0 by 1.3 in. and weighs 2.5 pounds

Altair: Another PC Milestone

BY LESLIE GOFF

A SLEEPY Southwestern town — not bustling Silicoo Valley — turned out to be the birthplace of one of the first mass-produced PCs.

It was in Albuquerque, N.M., in 1974 that a small electronics company called Micro Instrumentation Telemetry Systems (MITS) embarked on creating a small computer for individual use. Partly in response to a challenge by a magazine editor, Les Solomon of *Popular Electronics*, and partly in a last-ditch effort to save his bankrupt company, Ed Roberts and two partners designed the Altair, a kit computer named after a planet Solomoo's 12-year-old daughter had seen on an episode of *Star Trek*.

The machine came with the then-braod-new Intel 8080 processor, 256 bytes of memory and a panel of switches and hlinking lights.

For $400, anyone could have a computer. Never mind that getting the Altair to operate was a tedious task and that the loading of data was an elaborate, repetitive process of flipping countless switches to yield rather mundane results.

The Altair's appearance on the January 1975 cover of *Popular Electronics*, which hit newsstands in the late fall of 1974, fired the imagination of thousands of technically inclined hobbyists and helped fuel a growing demand for processing power.

THE SCELBI 8H also hit the computer scene in 1974, but disappointing sales doomed it

"We lusted after computers. Having your own computer was like sex," Roberts recalls. "It's hard to see that now because computers are so ubiquitous, but the idea of owning your own machine was just the ultimate."

1974

The Altair became what is widely considered to be the first-ever commercial, mass-produced "personal computer" — a term Roberts takes credit for coining.

But it wasn't necessarily the first commercial PC. For example, in March 1974, the Scelbi (SCientific, ELectronic and BIological) Computer Consulting Co. in Milford, Conn., advertised a computer based on the earlier Intel 8008 microprocessor. Priced at $565, it came with 1K byte of programmable memory and was aimed mainly at the scientific market.

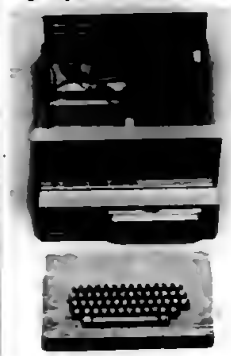
Io July of that year, *Radio Electronics* magazine puhlished an article oo another Intel 8008-based home computer kit, dubbed the Mark-8.

Neither the Scelbi 8H nor Mark-8 sold well, however; Scelbi discontinued the 8H by that December. It produced the Scelbi 8B — a business-market version of the machine — the following year hut sold only about 200 boxes. Roberts muses that he never saw a Scelbi 8H, "and no one else did, either."

But MITS suddenly went from bankruptcy to backlogged orders. Within a month of the *Popular Electronics* article, MITS was getting as many as 250 orders per day, Roberts says.

"We never caught up," he says. "When we sold out three years later [to Pertec Computer Corp.], we still had a huge backlog. That's why the competition was able to be so successful."

THE REVOLUTIONARY ALTAIR originally sold for $400



The Altair caught the attention of two Harvard students, who dropped out of school to work with Roberts. Paul Allen and Bill Gates were able to convince him that they could make his box more fully functional by writing a computer language and other software for it.

Roberts hired Allen to head up software development for the Altair, and the three agreed oo a royalty arrangement for a version of the Basic computer language that would run oo the machine. But Roberts downplays Gates' role.

"Bill Gates was a relatively minor character at MITS," he says. "We had already shipped thousands of machines, and we had software before I ever met him. And he was such a pain to deal with; he only worked on ooe project."

Roberts, now a doctor in the small town of Cochran, Ga., says most of his patients have no idea that he created the progenitor of their home PCs.

His is not among the most often-repeated names in Silicon Valley history. But Roberts gets annoyed only when others take credit for what MITS pioneered, he says. "For a long time, Apple [Computer Inc.] claimed credit for inventing the personal computer," he says, "but we had shipped 50,000 machines and had dealers worldwide before they ever had their first computer."

For the record, he notes that he designed the Altair with MITS partner Bill Yates — "not Bill Gates." Jim Bybee, an engineer, created the system bus. ◗

Goff is a frequent contributor to Computerworld. Contact her at lgoff@ix.netcom.com.

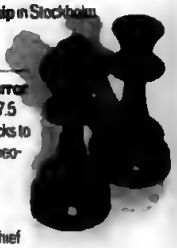
Technology Happenings

■ **Digital Equipment Corp.** enters the Fortune 500 at No. 475.

■ ***Creative Computing*** magazine debuts. It's one of the first magazines to focus on the recreational and educational uses of computers.

■ **Vinton Cerf** and **Robert Kahn** publish "A Protocol for Packet Network Interconnection," which specifies the design of a Transmission Control Program.

■ At the **First World Computer Chess Championship** in Stockholm, the Russian program KAISSA is the winner.



■ **A programming error** in New York causes $7.5 million in welfare checks to be sent to the wrong people. **"We save a lot of money – when it works right,"** says Harold Stein, acting chief of the city's Human Resources Administration.

■ **Tandem Computers Inc.** is founded.

■ **Zilog Inc.**, founded by former Intel Corp. employees, introduces a new microprocessor, the Zilog **Z-80**. Intel also introduces a new chip, the **8080**.

■ **MIT's David Silver** designs a robotic arm, called the Silver Arm, to perform small-parts assembly. It uses feedback from pressure sensors and delicate touches.

■ **IBM's John Cooke** conceives the idea for the first Reduced Instruction Set Computer.

■ On June 26, A Marsh Supermarket in Troy, Ohio, scans a 10-pack of Wrigley's gum. It marks the **first in-store use of a bar-code scanning system.**

Other Notables

■ Garrison Keillor's ***A Prairie Home Companion*** radio show debuts.

■ On April 8, **Hank Aaron** of the Atlanta Braves breaks Babe Ruth's record when he hits his **715th career home run**, in a game against the Los Angeles Dodgers.

■ The **Miami Dolphins** win their second straight Super Bowl by beating the **Minnesota Vikings**, 24-7.

■ ***People*** magazine debuts.

■ **Best Picture:** *The Godfather, Part II.*

■ Flashback is produced with the assistance of The Computer Museum History Center in Mountain View, Calif.

Patricia Hearst, the 19-year-old granddaughter of publishing magnate William Randolph Hearst, is kidnapped by members of the Symbionese Liberation Army.

On April 15, Hearst and her kidnappers participate in a San Francisco bank robbery.

The House Judiciary Committee passes the first of three articles of impeachment against President Nixon, for obstruction of justice.

JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER

The Pentagon requests an additional $474 million for military aid to Saigon. For the first time since the Tonkin Gulf Resolution in 1964, the House denies the request.

Richard Nixon resigns from the presidency; Vice President Gerald R. Ford is sworn in as president.

President Ford grants a "full, free and absolute pardon" to Nixon. He also grants conditional amnesty to Vietnam War draft evaders and deserters.

The U.S. government files an antitrust suit against AT&T.

Fran Quittel

Nationally Recognized Career Expert and Computerworld's CareerAdvisor Columnist

With a lengthy background in high tech careers and recruiting, Computerworld's CareerAdvisor Fran Quittel specializes in providing in-depth information for job seekers and a "Recruiting Scoreboard" to help employers audit and improve their internal recruiting practices. Fran is author of the book *Firepower: Everything you need to know before and after you lose your job* and is the original creator of The FirePower Career Forum on The Microsoft Network. She also publishes career advice at www.careerbabe.com and tips for employers at www.yourcareer.com

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This new feature appears ... and is Computerworld's interactive career advice column. Simply submit your questions to Computerworld's Career... http://www.computerworld... and yours might be ... and online pages of C... by nationally ... Fran Quittel.

The Web's Most Wanted

E-commerce continues to drive the demand for Web skills, especially for IT pros with database experience

By Leslie Goff

COMIC STRIPS. Jelly beans. Bunnies (Playboy bunnies, that is). Three different Web sites, three different companies, three different editorial products. But they all have one thing in common: a need for database skills.

The expansion of e-commerce and the move toward dynamically generated Web pages have made Web development teams more reliant on databases, managers say.

Looking ahead, as Web sites become more complex and the entertainment factor grows more important, Internet team managers say they'll be looking for people who understand broadband programming and how to deliver audio and video over the Web, as well as people who can manage quality assurance.

Computerworld spoke with representatives of three companies that have successfully used Web sites to create a community for their products. Here they tell us what they look for in Internet professionals, when they're willing to train staff to get the skills they need and how e-commerce is changing the picture.

	RICH CUPERTINO Senior manager of technology services, Playboy Entertainment Group (a division of Playboy Enterprises), Beverly Hills, Calif. *www.playboy.com* and *cyber.playboy.com*, the Playboy Cyber Club	**GREG STREETER** Information systems manager, Herman Goelitz Inc. (candy-maker; manufacturer of JellyBelly gourmet jelly beans), Fairfield, Calif. *www.jellybelly.com*	**MICHAEL ZIMBALIST** General manager, UM Online Services, United Media (comic strip syndication and licensing company; "Dilbert" and others), New York. *www.comics.com*
What are the top three Internet skills you need on your Web team?	Web-site development tools including HTML, JavaScript and Vignette (Web application middleware), as well as Oracle8, e-commerce applications development and streaming audio and video.	Graphics ability; programming skills including HTML, Perl, CGI and Java; and database skills.	Project management; systems integration including all the Web-based programming skills and how they intersect with the enterprise networking portion of our architecture; and marketing – people who can think about content from the standpoint of hooking and attracting visitors.
What kind of prior job experience do you look for in a job candidate?	I always expect a candidate to bring [to an interview] the URL of something they developed and can show me: "This is what I designed, this is how it works." The proof is always in the pudding – as long as they aren't violating any [nondisclosure] agreements with their previous employers.	We're more flexible on that because we are willing to do a lot of training. We would prefer two to three years' minimum experience in the Web-development business. And we look for food manufacturing experience – that's a very big industry here in Northern California	People who have worked in a very team-oriented environment and who have been through the design and launch of at least one significant site, so they know the bumps in the road.
What impact has e-commerce had on your skills needs?	It has made us look for a more well-rounded individual in terms of their understanding of the Net, their knowledge of the technologies and off-the-shelf products and how to integrate them to build an online ordering system. It's a preference to have someone who knows how what they are developing ties into other things, who can integrate their modules with everything else.	E-commerce is what makes the Oracle skills so much more important and makes the scripting skills essential.	Right now we have a turnkey (e-commerce) solution from a vendor, but we are beginning to host a five backup in-house, and we're using databases and Cold Fusion to dynamically generate Web pages, so I could see adding those skills.
When are you willing to train to get the skills you need?	If in fact a candidate has a good amount of the skills and experience we want, but not the precise language that we want, we will send them out for training in that language. We've sent people for Vignette training, for example. Or if they have HTML, Java scripting and SQL Server instead of Oracle8, we'll send them for Oracle8 training.	We've done training in Oracle and in CGI, Perl and scripting. Those are the areas where we've had to do the most; those are the harder-to-find skills. It's easy to find an HTML programmer, but someone with real Oracle experience and fluid scripting skills is not as easy.	We try to make sure everyone is offered the opportunity to expand their skills, so we've offered training in everything from Photoshop to HTML to Perl.
For which skills do you rely on consultants, and why?	The site is hosted externally. We maintain the security infrastructure in-house, but we use an outside consulting firm. The site started out completely outsourced, and as technologies and skill sets have risen to the level where it's business-smart to bring responsibilities in-house and eliminate overhead, we have done that.	We have cohosted servers in-house and are using outside security consultants to make sure it's all set up properly. We're content to hire out that skill because it's really hard to have one person taking care of all that – they have to stay up-to-date on all the latest requirements.	We have a security firm that we use to install and test secure systems. . . . You want people who are experts at thinking of all the ways someone could create a security breach, and that really needs to be someone outside. We also outsource ad management, e-commerce and order fulfillment.
Any advice for people who want to enter this area?	The best way of getting a good feel for the technologies out there is to bring the technology into your own home. Play with it in your early-evening wind-down hours. That's the best way of putting the icing on the cake of your technical experience.	It's very hard to get the first job, so take your classes. Do as much as you can on your own – develop your own Web site and get as much practice as you can. Once you get one to two years of experience, then you're really at a premium.	Plan on working long hours.

Goff is a freelance writer in New York. Contact her at lgoff@ix.netcom.com.

The 1999 Regional Conferences

Monday, August 30, 1999
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Chicago, Illinois

Monday, September 13, 1999
Sheraton Valley Forge Hotel
King of Prussia, Pennsylvania

Monday, September 27, 1999
Fairview Park Marriott
Falls Church, Virginia

Monday, October 4, 1999
Boston Marriott Burlington
Burlington, Massachusetts

Monday, October 18, 1999
Wyndham Garden Hotel
Dallas, Texas

Monday, November 8, 1999
J.W. Marriott Hotel - Lenox
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Monday, November 15, 1999
Hotel Sofitel
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As the e-Business Strategist/Consultant, you will be expected to work with account executives in pre-sales and demand generation events to provide an overall context for the customer's decision making with respect to e-Business IT program initiatives. Responsibilities include facilitating structured workshops for e-Business visioning and strategy-setting with a focus on linking the customer's business models to specific IT initiatives; providing key business-to-IT direction linkage and relationship management; participating in strategic planning sessions to ensure that knowledge about trends and patterns in customer decisions are used.

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As the e-Business Consultant, you will be responsible for the Knowledge Management (KM) e-Business programs to establish a KM market presence, capability and strategy for the Network and Systems Integration Services group in the field. You will identify and establish agreements with consulting companies who work in front-end KM consulting, including business and organization process design. Additional responsibilities include: working on teams in the M&C, BI and Intranet areas to get specific KM services coordinated; working with marketing and the Enterprise Computing Group to verify receipt of services components included in their solutions; working with field organization to execute KM plans and drive business growth. A master's degree is preferred.

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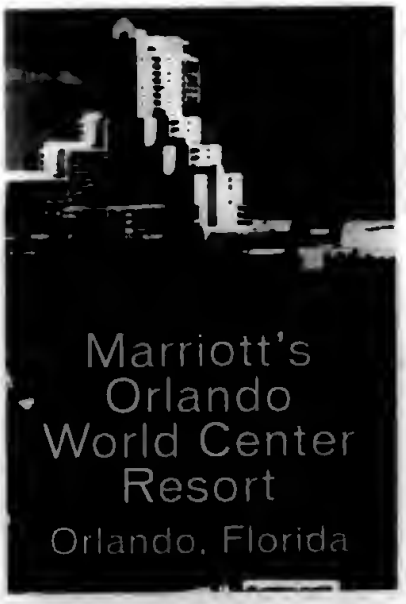

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Software Engineer needed by Computer Systems Integrator in Miami Lakes, FL. To analyze, dsgn & dvlp new s/ware interface products. dvlp new s/ware prgms using n/work prgmg & C/S technology and dvlp/enhance/test SQL applics on commercial d/bases using Oracle, ODBC & SQL Server prgmg in C/C++ & Embedded SQL under Windows & UNIX envirnmt. Must have Masters in Comp Sci or Engg. Respond to HR Dept. Applied Automation Techniques, Inc., 5753 Miami Lakes Drive, Miami Lakes, FL 33014

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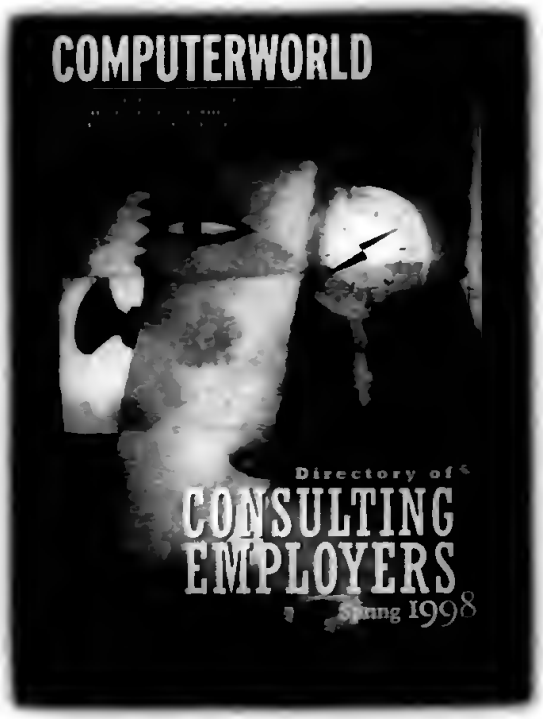

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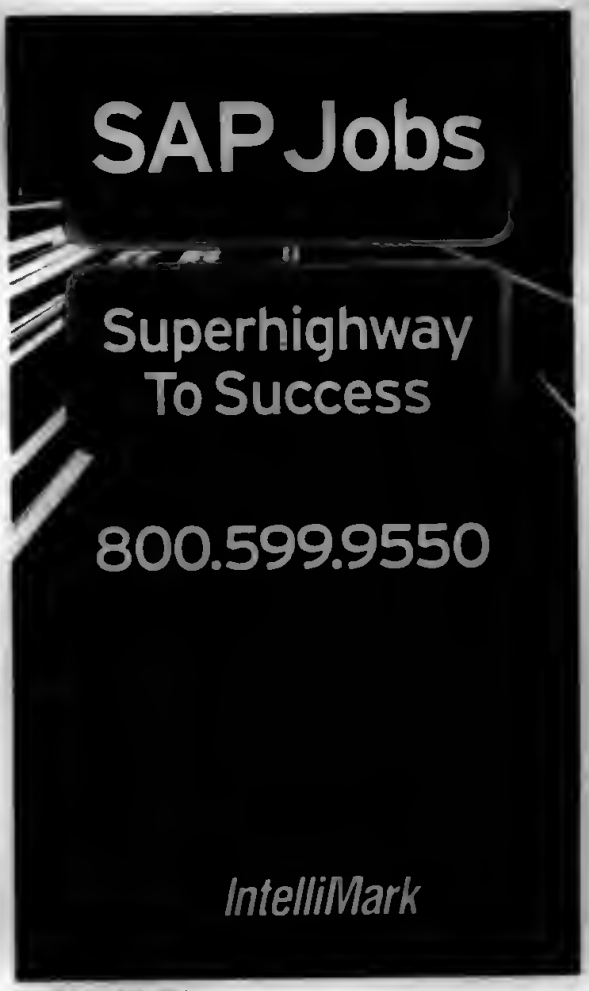

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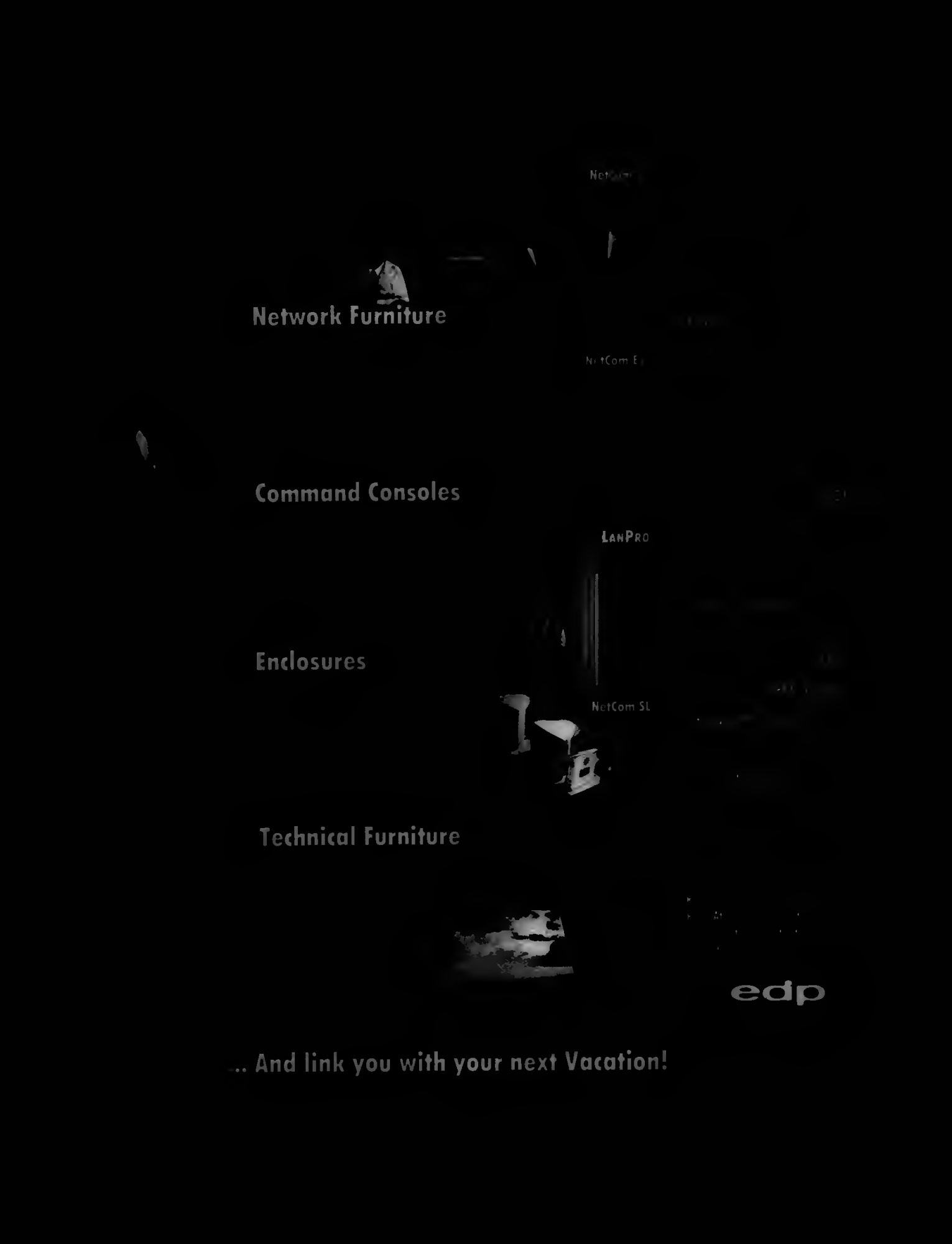
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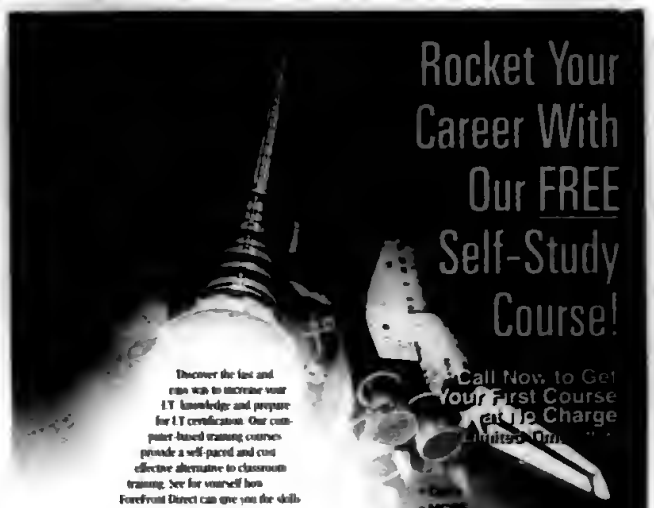

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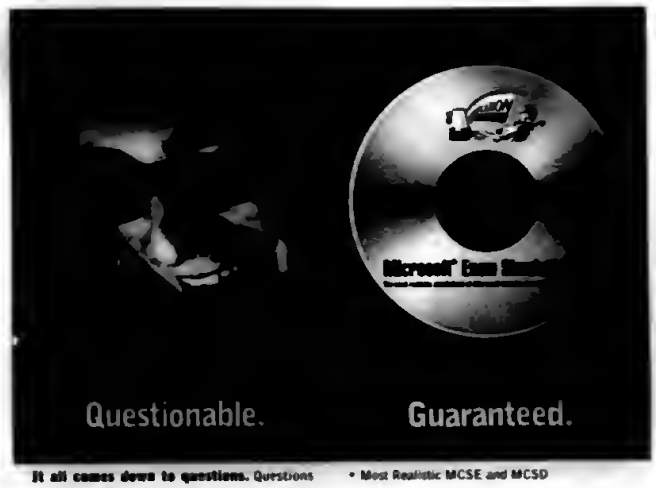
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ADVERTISERS INDEX

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Compaq Computer Corp. Servers www.compaq.com	37
Compaq Computer Corp. Brand www.compaq.com	43, 45
Computer Associates NetworkIT Pro www.cai.com	C2
Ericsson www.ericsson.com	15
GENICOM www.genicom.com	59
Hycurve www.hycurve.com	51
Information Builders www.ibi.com	5
InterSystems Corp. www.intersys.com	67
Kingston Technology www.kingston.com	C4
Liebert www.liebert.com	32-33
Microsoft Windows 2000 www.microsoft.com	18-19
Microsoft Office 2000 www.microsoft.com	22-23
Microsoft NT Server www.microsoft.com	26-27
Oracle Corp. www.oracle.com	7
Pacific Bell www.pacificbell.com	55*
reSOURCE PARTNER www.resourcepartner.com	10
Romanian Software Expo.	28
SAS Institute www.sas.com	31, 44
Seagate Software www.seagate.com	11
StarBase www.starbase.com	C3*
The 100 Best Places to Work In IT	40/41
Veritas www.veritas.com	21
Xerox PSO www.xerox.com	13
Xerox Corporate www.xerox.com	38-39
Xircom www.xircom.com	81

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COMPUTERWORLD ONLINE INDEX

@Backup www.backup.com
BrainStorm Group www.brainstorm-group.com
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Intrant Solutions www.intrantsol.com
Main Control www.maincontrol.com
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Page number refers to page on which story begins. Company names can also be searched at **www.computerworld.com**

3COM CORP 10,20,78
ABERDEEN GROUP INC 4,69,69
ABT CORP 20
ADITI CORP 69
ADVANCED MICRO DEVICES INC 14
ADVANTICA RESTAURANT GROUP INC 24
AETNA INC 69
ALLIEDSIGNAL INC 24
AMAZON.COM 34
AMERICA ONLINE INC 30,34,35,69
AMERICAN MANAGEMENT ASSOCIATION 14
AMERICAN MEDICAL ASSOCIATION 78
ANDERSEN CONSULTING 4,46
APPLE COMPUTER INC 70
APPNET SYSTEMS INC 100
AT&T CORP 6
ATLANTIC RICHFIELD CO 4
AUTOBYTEL.COM 20
AUTOMATED DATA PROCESSING 46
AUTOMATION INC 1
AVANTGO INC 12
AVON PRODUCTS INC 69
BANYAN SYSTEMS INC 20
BELL ATLANTIC CORP 69
BELLSOUTH CORP 12
BG PLC 20
BG TECHNOLOGY 20
BLOCKBUSTER ENTERTAINMENT GROUP 1
BLOOMBERG LP 6
BLUETOOTH SPECIAL INTEREST GROUP 12
BOSE CORP 60
BOSTON UNIVERSITY 42
BOW STREET SOFTWARE 72
BP AMOCO PLC 4
BRIGHTWARE INC 46
BROADVISION INC 72
CABLETRON SYSTEMS INC 10,30
CALIFORNIA BOARD OF EQUALIZATION 6
CAP GEMINI AMERICA LLC 54
CAROLL INC 8
CARNEGIE MELLON UNIVERSITY 60
CARSDIRECT.COM 1
CATERPILLAR INC 73
CBS INC 12
CCP INDUSTRIES INC 69
CHARLES RIVER VENTURES 72
CHARLES SCHWAB & CO 8
CHEMATCH INC 14
CIRCUIT CITY STORES INC 1,72
CISCO SYSTEMS INC 6,10,36,46
CLIENT/SERVER LABS 70
CODINOS INC 67
COLGATE-PALMOLIVE CO 101
COMPAQ COMPUTER CORP 14,30,101
COMPUSA INC 4
COMPUTER SCIENCES CORP 24,58
CONCENTRIC NETWORKS CORP 69
CONNECTED CORP 67
COREL CORP 10
CP SHIPS LTD 42
CRITICAL PATH 30
D. E. DAVIDSON & CO 101
DALLAS SEMICONDUCTOR CORP 69
DELL COMPUTER CORP 6,14,46
DELOITTE CONSULTING 1
DELPHI GROUP INC 73
DELTA AIR LINES 54
DEMIDEC RESOURCES 76
DEPARTMENT OF JUSTICE 24
DEVRY INSTITUTE OF TECHNOLOGY 48,69
DIGITAL EQUIPMENT CORP 14,30
DOLE FOOD CORP 76
DOW CORNING INC 69
DRAPER FISHER JURVETSON 24
DRUGSTORE.COM INC 76
EBAY INC 20,34,38,69
ECONOMETRICS INC 60
EDWARD JONES & CO 14,30
ELECTRONIC DATA SYSTEMS CORP 24
EMC CORP 26
ERNST & YOUNG LLP 6
ETRADE GROUP INC 20,34
EVEREST CORP 24
EXCALIBUR TECHNOLOGIES CORP 20
FEDERAL AVIATION ADMINISTRATION 54
FINANCIAL EXECUTIVES INSTITUTE 47
FINGERHUT COS 66,72
FORRESTER RESEARCH INC 20
GDX SOFTWARE 66
GARMIN INTERNATIONAL INC 24
GARTNER GROUP INC 24
GENERAL MOTORS CORP 20,30
GEODAN EDP BV 8
GGA INFORMATION GROUP INC 4,12,46,73
GOLDMAN, SACHS & CO 16
GORDON & GLICKSON PC 6
GTE INTERNETWORKING 69
HARVARD DIVINITY SCHOOL 14
HEINEKEN USA INC 24
HERMAN GOELITZ INC 69
HERTZ CORP 24
HEWLETT-PACKARD CO 6,14,28,69,78,78,101
HITACHI DATA SYSTEMS 26
HOECHST MARION ROUSSEL INC 1
HOLBRECHT LIEBERMAN ASSOCIATES 56
HUNTER COLLEGE 54
HUSH COMMUNICATIONS CORP 42
I2 TECHNOLOGIES INC 24
IBM 1,14,30,42,43,69,69,83,101
IBM GLOBAL SERVICES 24
ILLUMINATA INC 69
IMARK COMMUNICATIONS 59
INFLUENT TECHNOLOGY GROUP INC 58
INFONETICS RESEARCH CORP 69
INGRAM MICRO INC 42
INPRISE CORP 67
INTEL CORP 12,49,69,83
INTERNATIONAL COMMUNICATIONS FOR MANAGEMENT 69
INTERNATIONAL DATA CORP 18,24,42
IPO FINANCIAL NETWORK 100
IRONBIDE TECHNOLOGIES INC 43
ISI FINANCIAL MANAGEMENT ASSOCIATION 47,68
J.D. POWER & ASSOCIATES 1
JAMNEY MONTGOMERY SCOTT INC 20
JEFFERIES & CO 10
JOHNSON & JOHNSON 68
KANA COMMUNICATIONS INC 46
KLEINER PERKINS CAUFIELD & BYERS 73
KMART CORP 4
KNIGHT RIDDER 4
KPMG LLP 4
L. L. BEAN INC 4
LINCOLN ELECTRIC CO 62
LOMBARD CANADA INC 69
LOTUS DEVELOPMENT CORP 12,20,78
MACMANUS GROUP 4
MAIL.COM INC 100
MANUGISTICS GROUP INC 24
MATRIX PARTNERS 73
MCI WORLDCOM INC 30,69
MEDICAL MUTUAL OF OHIO 54
MERRILL LYNCH & CO 24,1
META GROUP INC 46,69
METAMOR INDUSTRY SOLUTIONS 60
METRICOM INC 20
MICROSOFT CORP 1,6,12,16,35,36,46,68,69,70,72,74,83
MII 6,40
MONSTER.COM 4
MOTOROLA INC 8,68
NEILSEN NETRATINGS INC 72
NETSCAPE COMMUNICATIONS CORP 6,36,68
NETWORK ASSOCIATES INC 48
NEW YORK CITY DEPARTMENT OF CITY PLANNING 12
NEW YORK STATE ELECTRIC AND GAS CORP 78
NEWBRIDGE NETWORKS CORP 100
NIKE INC 8
NOVELL INC 73
OFFICE DEPOT INC 4,43
OFFICEMAX INC 4
ORACLE CORP 4,8,20
PACIFIC BELL 46
PARAGON TECHNOLOGIES INC 6
PATRICIA SEYBOLD GROUP 46,66,73
PC DATA 12
PENSKE TRUCK LEASING CO 42
PEOPLESOFT INC 6
PETROCHEMNET INC 14
PHILADELPHIA FEDERAL CREDIT UNION 46
PHILIPS CAPPN 74
PINE STREET INN 14
PLAYBOY ENTERTAINMENT GROUP 69
PRODUCT DEVELOPMENT CONSULTING 60
PURDUE UNIVERSITY 48,69
QUALCOMM INC 42
QUESTENT ENTERPRISES LTD 62
QWEST COMMUNICATIONS INTERNATIONAL INC 16
REALNETWORKS INC 70
RESEARCH IN MOTION LTD 69
ROADWAY EXPRESS INC 42
ROMAC INTERNATIONAL INC 12
ROSETTANET 43,72
ROYAL CARIBBEAN INTERNATIONAL 60
SAP AG 4
SAPIENT 46
SCHNEIDER NATIONAL INC 42
SECURITIES AND EXCHANGE COMMISSION 16
SECURITIES INDUSTRY ASSOCIATION 16
SKYTEL CORP 24,69
SOCIETY FOR INFORMATION MANAGEMENT 60
SOFTWARE TECHNOLOGIES CORP 67
SOLECTRON INC 8
SPECTRUM 10
SPRINT CORP 16
STANFORD UNIVERSITY 76
STAPLES INC 43
STATE UNIVERSITY OF NEW YORK AT BUFFALO 46
STONEHILL COLLEGE 47
STREAMLINE.COM INC 100
SUN MICROSYSTEMS INC 14,62,69,69
TATUNG SCIENCE & TECHNOLOGY INC 69
TELOS SYSTEMS 70
TEXACO INC 60
THE AEROSPACE CORP 12
THE ASP FORUM 16
THE BOEING CO 8
THE DAP INC 4
THE HOME DEPOT INC 1,42
THE INFORMATION MANAGEMENT FORUM 60
TORRENT SYSTEMS INC 69
TRANSNET CORP 101
TRAVELERS PROPERTY CASUALTY CORP 12
TRIPLE I CONSULTING INC 69
U.S. DEPARTMENT OF DEFENSE 24
UNITED AIR LINES INC 69
UNITED MEDIA 69
UNIVERSITY OF CALIFORNIA AT BERKELEY 49
UNIVERSITY OF MIAMI 47
US WEST INC 16
VERISIGN INC 42
VERITY INC 73
VIANT CORP 100
VINCENTE CORP 73
VOLUNTARY INTERINDUSTRY COMMERCE STANDARDS ASSOCIATION 26
VULCAN VENTURES INC 20
W. B. MASON INC 42
WAREFERN FOOD CORP 42
WAL-MART STORES INC 6,62
WARBURG DILLON READ 12
WARNER BROS. INC 73
WHITNEY NATIONAL BANK 69
WHITTMAN-HART INC 16
WILEY, REIN AND FIELDING 16
WILSON SONSINI GOODRICH & ROSATI 42
WIRELESS INTERNET & MOBILE COMPUTING 69
WISE BUSINESS SOLUTIONS INC 6
WORLDTALK CORP 69
YAHOO 24
ZIPLIP.COM INC. 42

PERCENT		PERCENT	
Iomega	21.7	Checkfree	-36.0
Globalstar Telecom. Ltd.	21.6	ADC Telecommunications Inc.	-17.3
PSINet Inc.	18.6	Keane	-14.2
Procom Tech Inc.	12.8	Picturetel	-12.2
Tektronix	11.7	Pixar	-12.1
National Semiconductor (H)	10.4	Micron Technology	-10.6
Network Equipment Tech.	10.3	Computer Horizons Corp.	-10.5
National Instruments Corp. (H)	8.4	Gartner Group	-10.0

DOLLAR		DOLLAR	
Adobe Systems Inc. (H)	6.44	Checkfree	-13.88
PSINet Inc.	5.69	America Online	-8.75
Uniphase (H)	5.19	ADC Telecommunications Inc.	-8.69
IBM (H)	4.44	Pixar	-5.81
Network General	4.38	Lexmark International Group, Inc.	-5.75
Hughes Electronics/GM	4.38	SGS-Thomson Microelectronics (H)	-5.69
Globalstar Telecom. Ltd.	3.81	Saptent Corp.	-5.50
National Instruments Corp. (H)	3.56	Safeguard Scientifics	-5.38

Is the Internet Stock Party Over?

Some recent Net IPOs get lukewarm receptions

BY LORRAINE COSGROVE WARE

INITIAL PUBLIC OFFERINGS (IPO) of Internet-focused companies have met with little fanfare recently, signaling that the days of buying anything .com may be coming to a close.

Take June 18. Streamline.com Inc. (Nasdaq:SLNE), a consumer goods online ordering and delivery service in Westwood, Mass., started its IPO at a price of $10 a share and dropped to $7.63 at closing (see chart). That same day, New York-based e-mail service provider Mail.com Inc. (Nasdaq:MAIL) revised its original offer price down from $10 to $7, then experienced a slight gain of $1.75 to close at $8.75.

Another June 18 IPO, AppNet Systems Inc. (Nasdaq:APNT), fared slightly better — its stock didn't lose value in its first day of trading. The Bethesda, Md.-based Internet services provider launched its offering at a price of $12 a share and closed at the same price.

GoTo.com	$15	$22.37
Viant	$18	$24.37
Mail.com	$7	$8.75
AppNet Systems	$12	$12
Streamline.com	$10	$7.63

The loss of enthusiasm isn't just afflicting IPOs. Overall, Internet stocks have experienced steep price declines since April, with some losing up to 50% of their value. Some analysts are calling the slump a long-awaited "correction" to very high valuations of Internet stocks. But other market watchers say the novelty is wearing off because of the glut of Net stocks.

"The market has changed from a seller's market to a buyer's market," says David Menlow, a researcher at IPO Financial Network and editor of the newsletter "IPO Frontline."

"There are too many Internet IPOs to choose from," Menlow says.

In May alone, 25 Internet-related companies launched IPOs. And the flood is likely to continue through the summer, as Internet companies rush to get funding before interest rates rise or the competition for investors' dollars increases further, analysts say.

But the news isn't bad for all Net stocks. Investors are doing more research and seeking companies with unique technology and services and solid business strategies. Such companies might include Internet search engine GoTo.com Inc. (Nasdaq:GOTO) and e-commerce services provider Viant Corp. (Nasdaq:VIAN). These two companies launched IPOs June 18 and posted first-day gains of roughly 50%.

Investors "are looking for uniqueness or a new twist to already-successful technology, a proven Internet underwriter and an impressive list of pre-IPO investors," Menlow says. Companies with these credentials will command premium pricing.

KEY: (H) = New annual high reached in period
(L) = New annual low reached in period

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Eight-Way Servers Entice Users Looking to Consolidate

Compaq, HP, IBM tout scalability features

BY STACY COLLETT
NEW YORK

Aaron Goldring and Anthony Cuoco came to PC Expo last week on a mission — to find replacements for Colgate-Palmolive Co.'s 150 aging servers that run its help desk operations, to free up some office space and improve systems management.

"We'd like to try to consolidate down to 10 [servers] or less, if possible," said Goldring, an analyst at TransNet Corp. in Somerville, N.J., which runs Colgate's hardware and software operations.

The duo's search led them to demos of eight-way servers by Compaq Computer Corp., IBM and Hewlett-Packard Co. that offer performance improvements of 70% to 146% across four-way servers, less downtime and greater scalability. The servers won't be shipped until late summer when Intel Corp. releases its Profusion eight-way chip set, but some prospective users are already enthused about the servers.

IBM's Netfinity 8500R, priced from approximately $20,000, will offer light-path diagnostics where a small light on each component leads users directly to a failed fan or other piece of hardware. IBM's systems management Peripheral Component Interconnect adapter predicts system failures and alerts the system manager by pager or PalmPilot and even calls IBM's customer service center automatically.

HP will offer self-monitoring hardware components on its NetServer LXr 8500. If a component fails, it will automatically take itself out of the configuration while the other parts keep uptime, said Stefano Paoletti, NetServer product manager.

S-B Power Tool Co. in Chicago is beta-testing HP's eight-way server running NT 4.0 and Microsoft Exchange for 600 to 800 users. "We're noticing a clear performance increase" over four-way servers, said Stephen Wolfcale, director of operations.

Continued from page 1

Car-Buying Site

the consumer and dealer relationship, and it's something all the big automakers are working on," said Daron Gifford, a director at Deloitte Consulting in Detroit.

But each automaker will be restricted to offering inventory from its own dealers, whereas AutoNation's dealers sell a wider variety of makes, he added.

One such competitor is General Motors Corp., which last week said it plans to sell direct over the Internet starting with 15 major pilot programs (see story, page 20).

Under the AutoNation deal, consumers can choose cars from AutoNation's complete inventory at 400 new-car dealerships and 36 used-car megastores.

The dealer that supplies the vehicle gets the commission because the company owns all the dealerships. However, there is competition among salespeople because different staffs handle the Web and walk-in sales.

Some 270 of AutoNation's dealers already sell via their own Web sites, which will eventually be linked to the master site.

Their influence on the company's business has already been palpable. The company launched its first e-commerce site only last year, and a customer poll late last year showed that 51% wouldn't have bought a car through the company had they not found it through the Internet. AutoNation reported $18 billion in revenue last year.

CarsDirect.Com, with backing from online computer direct-sales pioneer Michael Dell, also announced that it would start selling cars over the Net later this year.

No Haggling

"What differentiates [AutoNation's] initiative is that AutoNation posts the price of the vehicle as configured for the consumer rather than referring the shopper to a dealer to haggle over price," said Chris DeNove, an analyst at J. D. Power & Associates' Calabasas, Calif., office.

At the AutoNation Web site (*www.autonationdirect.com*), consumers select a car, fill out a form and reserve the car with a credit card. The form is sent to a database linked to a paging system that alerts dedicated online salespeople when a lead comes in.

Art DeLaurier is vice president of e-commerce technologies at Fort Lauderdale, Fla.-based AutoNation. He said having the effort spearheaded by Scott Barrett, a former president at Blockbuster Entertainment Group, led to a marriage of business and technology skills to provide a new level of customer service.

WHAT WINDOWS NT 4.0 LICENSES COST USERS NOW:

Server license*: $1,609 for the server plus 25 client licenses
Additional client licenses for each user: $699 (for pack of 20 licenses)

MODEL USERS WOULD LIKE TO SEE:

User buys one license that covers the server and all users. User expects to pay comparable price, but new model would save administrative costs and time in handling licensing issues.

Continued from page 1

Microsoft Mulls

ical tool able to handle thousands of users and applications worldwide, information technology administrators can't be burdened with tracking a confusing jumble of server, client-access, terminal-server and workstation licenses. Microsoft needs to offer users an easier, cheaper way of handling its software, they said.

"If I could just worry about licensing for the server and not each user, it would give us a lot more flexibility," said Danette Searle, head of global support at Kansas City, Mo.-based Hoechst Marion Roussel Inc., an international pharmaceutical company. "It's a nightmare to manage all our licensing in countries around the globe. Take our administrative costs because of licensing alone. ... We could reduce that by 60%."

Microsoft's current licensing policy calls for a customer to not only license the server, but also to buy a license for every user that touches it, said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass.

Analysts and corporate users noted that Microsoft frequently makes special licensing deals with new or very large users, offering them special rates or licensing deals.

Although reportedly nothing has been finalized, moving to a server-centric model might mean customers would pay for the server license alone (see chart). But all the sources pointed out that Microsoft could come up with variations on the server-based model.

"Microsoft's [current licensing] model makes it two to three times more expensive than, say, a Unix or an IBM setup," Kusnetzky said. "And as companies add new employees and other employees leave, it's difficult to make sure everyone is licensed. ... Microsoft touts low cost of ownership, but if you look at it, it's a high-cost solution. If they want to be an enterprise player, they have to use the model that has worked for everyone else for the past 30 years."

Brad Albers, director of information services at The Home Depot Inc., said, "For large-scale enterprises, server-based licensing is more in keeping with industry practice." Although he said he's unaware how many variables there might be in a new licensing agreement, Albers added that "this could be a much better strategy."

Sandra Carter, director of partner development at IBM, said Microsoft recently started discussing its plans with her company. She predicted a licensing change would mean cost savings for IBM customers looking to run Windows 2000. "Client and server technology is not as separate as it used to be," she said. "It has to be reasonably priced and workable for customers."

If Microsoft does change its model, it will be the latest in a string of changes this year.

In January, Microsoft announced it was cutting prices and simplifying licensing for its NT 4.0 Terminal Server, which is a multiuser version of its NT operating system. The company lifted a requirement that all Terminal Server clients also be licensed for NT Workstation, which cost $250. The new Terminal Server Client Access License rang in at $109.

Then in February, Microsoft tested a new licensing option for Internet service providers, allowing them to buy subscription-style licenses based on a per-server fee rather than the typical per-user fee.

That was followed by an announcement earlier this month that Microsoft is experimenting with a plan to lease its BackOffice suite as an alternative to selling it, specifically targeting application service providers (see story, page 1).

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FRANK HAYES/FRANKLY SPEAKING

'Reboot' revisited

THIS WEEKEND ENDS with the Fourth of July, so in the U.S. we'll all get a three-day weekend to eat hot dogs, watch parades and enjoy the fireworks. Six months from now, we'll be facing another kind of fireworks as the clock counts down to Y2K zero hour — and our companies will have another three-day weekend. But which three days? Will users knock off work on Thursday night, Dec. 30, and come back on Monday, Jan. 3? Or will they finish out the year on Friday, Dec. 31, not to return until the following Tuesday?

You'd think by now that question would have been answered as part of our year 2000 strategy. But it hasn't, at least not consistently.

Some companies plan to take Dec. 31 off. That's the day current U.S. law specifies as the federal holiday. Others have decided on Jan. 3, the following Monday. In some organizations, each business unit will decide whether to take Friday or Monday — or both.

As for the federal government itself, a resolution is sitting in a House subcommittee that would shift the official New Year's holiday from Friday to Monday, to give businesses more time to patch up Y2K problems.

But will that really help? Consider this: About the time office workers are arriving in New York and Washington on Dec. 31, Japan and Australia will be minutes away from midnight. As the hours tick by, customers, suppliers and subsidiaries across Asia and Europe will roll over to the year 2000 — or be rolled over by it.

That could mean wave after wave of year 2000-related problems pounding down on your business. Spurious orders generated by applications that think the warehouses are empty, for example. Transactions corrupted by power outages and telecom failures. Networks clogged by endless attempts to reconnect with crashed systems.

Those problems might not materialize. But if they do, they're the last things we need during our final day to prepare for millennial glitches.

Last September, I suggested *Computerworld* readers should shut down their computer systems on Dec. 31, as zero hour approached, and restart them after midnight passed. My biggest concern was that widespread year 2000 power failures might cause more damage to your hardware and data than any millennium bugs in your code.

Now, though, it looks like the North American electric power grid will for the most part stay up, or at least recover quickly enough that emergency backup power will be enough to handle any lapse.

So now I'm making a new recommendation: Shut down your whole business on Dec. 31.

To prep for Y2K, make sure your company takes Dec. 31 as a holiday.

If users take Dec. 31 as a holiday, we'll have all of Friday to prepare for zero hour. We can warn business partners that our systems won't be accepting any transactions. We can back up data, turn off PCs and throttle back processing on larger machines to an absolute minimum.

We may even be able to use information about problems encountered by the rest of the world to make last-minute fixes as midnight heads inexorably our way. And we can do it all without worrying about disrupting business.

You may have to lobby your top brass hard to make Dec. 31 the holiday if they've already settled on Jan. 3 or left the option to business units. But shutting down on Dec. 31 will protect the business — and give you crucial hours for Y2K preparations when you need them. If everything goes well, users can be back at their desks on Monday.

And if unfixed Y2K problems turn out to be a full-blown disaster? Well, then users will just get a *four-day* weekend. ◗

Hayes, Computerworld's staff columnist, has covered IT for 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

SERVICE THIS! Bob, a highly irritated Friend of the Tank, runs Microsoft Exchange, CA ARCserve and Compaq servers at his shop. A recent server failure munged a disk array and crashed Exchange Information Store. The Microsoft utilities wouldn't fix it. ARCserve wouldn't restore from its backup – an ARCserve, um, "feature" forced Bob to edit the Windows registry in order to do the restore.

That's all bad enough, but it turns out the source of the failure was a bad chip on the Compaq I/O boards – a known problem (a.k.a. Engineering Bulletin) that Compaq tech support wouldn't acknowledge until pressed. When Bob finally cornered a Compaq higher-up and explained the hassle, the higher-up made like the CIA and said, "You shouldn't have been told about that Engineering Bulletin." Really? Sharky says Compaq customers have a right to be warned – and Bob has a right to be steamed.

SO MICROSOFT REPS show up to deliver Windows 2000 Beta 3 at a big telecom company's Long Island, N.Y., offices. IT has a gag prepared. They've swapped out the 400-MHz Pentium IIs they use as domain name servers for 166s. When the Microsofties see the Stone Age servers, their eyes go wide. Especially when IT staffers tell them, deadpan, that the 166s work just fine running DNS services – on Linux. Who ever said us nerds have no sense of humor?

EDWARD YARDENI, year 2000 doomsayer and chief economist at Deutsche Morgan Grenfell in New York, on why he predicts a Y2K-driven recession next year: "My IT friends tell me that I don't appreciate how close to the edge our IT systems are on a good day." Your IT friends speak the truth, Ed.

PC EXPO. SHOW FLOOR. Two guys are looking at an eight-way server. First guy: "What would we use *that* for?" Second guy: "I guess when you have *really* bad apps, you need more CPUs."

MICROSOFT CFO Greg Maffei told an accountants' convention last week, "The quality of the temps [at Microsoft] is not as good as the quality of the full-time people." Do tell, Greg. He later backpedaled, but the Tank wants to hear what "permatemps" everywhere think of Maffei's comments. Fire away! Shark will protect your anonymity: **sharky@computerworld.com.**

The 5th Wave

E-mail Rich Tennant at the5thwave@rtt.net

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